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ACTH AND CORTISONE IN DIFFUSE COLLAGEN DISEASE AND CHRONIC DERMATOSES

DIFFERENTIAL THERAPEUTIC EFFECTS

Edwin N. Irons, M.D.
John P. Ayer, M.D.
R. Gordon Brown, M.D.
and
S. Howard Armstrong Jr., M.D., Chicago

This is a report of our experience with 16 patients under therapy with pituitary adrenocorticotropic hormone and cortisone for a number of the diffuse "collagen diseases" associated with severe, chronic dermatoses.

A considerable body of information has appeared in recent months dealing with the general aspects of pituitary adrenocorticotropic hormone and cortisone therapy and with commonly encountered complications. Striking alterations in disease processes through the use of pituitary adrenocorticotropic hormone and cortisone have been amply demonstrated by investigators working with Hench,[1] Thorn,[2] Baehr [3] and others.[4] The diseases affected include rheumatoid arthritis, acute rheumatic fever, disseminated lupus erythematosus and a number of the chronic dermatoses. The range indicates that cortisone and allied corticosteroids are not specific antirheumatics, but have a specificity for some factor common to all these diseases. The alteration in disease processes toward remission has, in general, been temporary or incomplete. However, in those instances of an acute flare-up in a chronic, smouldering process, the use of pituitary adrenocorticotropic hormone and cortisone has probably been life saving. The workers referred to have stressed the similarity of effects of pituitary adrenocorticotropic hormone and cortisone. In our studies we have been struck by some very important differences in the healing processes.

The aim of this paper is to contrast the effects of these two drugs with respect to therapeutic response, using the ready availability of the skin for detailed histological control, and to define more clearly the relation of therapeutic effects to complications in terms of dosage and metabolic variables. Through this medium, clinical study of the processes of disease and repair may be correlated with these more objective changes.

Although cortisone and pituitary adrenocorticotropic hormone are tools for the physiological study of disease, their increasing availability to physicians requires that the practical applications on a clinical level be brought out, with respect to both scope of utility and dangers.

CASE SELECTION

The diseases studied were disseminated lupus erythematosus, eight cases; periarteritis nodosa, one case; scleredema, one case; discoid lupus erythematosus, one case; psoriasis and arthritis, two cases; deep-seated exfoliative dermatitis, one case; superficial allergic dermatitis, one case; dermatitis herpetiformis, one case. Of the 10 patients with disseminated collagen disease, six were critically ill, and the other four were progressively deteriorating. In this group, there was one death. All six patients with dermatoses were materially

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This article has been abbreviated for publication in THE JOURNAL by omission of figures 5 to 12 and 14 to 16. These will appear in the authors' reprints.

Dr. John R. Mote of Armour and Company provided a supply of pituitary adrenocorticotropic hormone for initiation of these studies in the calendar year 1949. The cortisone was obtained from Merck & Company, Rahway, N. J.

Clinical Associates in Medicine (Rush), University of Illinois College of Medicine, and Assistant Attending Physicians, the Presbyterian Hospital of the City of Chicago (Drs. Irons and Brown); Assistant in Pathology (Rush), University of Illinois College of Medicine, and Resident in Pathology, The Presbyterian Hospital of the City of Chicago (Dr. Ayer), and Professor of Medicine (Rush), University of Illinois College of Medicine, and Chairman, Rush Department of Medicine, The Presbyterian Hospital of the City of Chicago (Dr. Armstrong).

Dr. George M. Hass guided us in the interpretation of histological material; Dr. J. H. Mitchell was consulting dermatologist, Drs. Evan M. Barton, W. G. Hibbs, B. G. Nelson and S. G. Taylor III participated in the study of patients on their respective services; Dr. William B. Looney of the resident staff arranged the details of clinical management; Drs. F. E. Senear and J. Murray Riddell Jr., of the Research and Educational Hospital of the University of Illinois College of Medicine, participated in the study of patients on their service; Drs. Gordon B. Fauley, J. M. McKusky and Cleveland J. White referred patients to this hospital for investigation and therapy, and Miss Beulah Hunzicker, Chief Dietitian of the Presbyterian Hospital, assisted in the dietary management of the patients under study.

1. Hench, P. S.; Kendall, E. C.; Slocumb, C. H., and Polley, H. F.: Effects of Cortisone Acetate and Pituitary ACTH on Rheumatoid Arthritis, Rheumatic Fever and Certain Other Conditions: A Study in Clinical Physiology, Arch. Int. Med. **85**: 545-666 (April) 1950.

2. Thorn, G. W.; Forsham, P. H.; Frawley, T. F.; Hill, S. R., Jr.; Roche, M.; Staehelin, D., and Wilson, D. L.: Medical Progress: the Clinical Usefulness of ACTH and Cortisone, New England J. Med. **242**: 824-833 (May) 1950.

3. Baehr, G., and Soffer, L. J.: Treatment of Disseminated Lupus Erythematosus with Cortisone and Adrenocorticotropin, Bull. New York Acad. Med **26**: 229-234 (April) 1950.

4. Proceedings of the First Clinical ACTH Conference, edited by J. R. Mote, Philadelphia, The Blakiston Company, 1950. Plotz, C. M.; Blunt, J. W., Jr., and Ragan, C.: Effect of Pituitary Adrenocorticotropic Hormone (ACTH) on Disseminated Lupus Erythematosus, Arch. Dermat. & Syph. **61**: 913-918 (June) 1950. Oppel, T. W.; Coker, C., and Milhorat, A. T.: The Effect of Pituitary Adrenocorticotropin (ACTH) in Dermatomyositis, Ann Int. Med. **32**: 318-324 (Feb.) 1950.

disabled. In this group, there was one death. All these patients were selected for study because it was thought that the severe disease process could be altered favorably and that clinical study could be supplemented by ready and detailed histological control.

ROUTINE CLINICAL STUDIES

A daily record of the patients' weight and fluid balance was kept, and the blood pressure was observed at least once daily. Balance studies with respect to sodium and potassium were done in initiating care of certain patients. The results were sufficiently in line with the reports of other workers so as not to warrant a detailed report here. In general, they have not proved necessary for care of the patient, provided dietary and other precautions are instituted. All patients were given a low sodium diet [5] with an additional 4 to 6 Gm. of potassium chloride or bicarbonate.

In this study, we have considered 100 mg. of pituitary adrenocorticotropic hormone daily in four to six divided doses for two or three days an optimum initiation. When therapy has been initiated with cortisone, in general we have used 200 mg. a day in single doses.[6] Instances of initial doses smaller than these will be considered in the discussion that follows.

Duration of therapy has ranged between one and four months, usually with doses reduced to the minimum consistent with obtaining therapeutic response. Details of these dosage schedules are likewise considered in the following discussion. No rule can be given for optimum duration of therapy. We have attempted to adjust therapy to the clinical response of the patient.

In an evaluation of the course of the disease and the physical status of the patients, rather extensive laboratory studies were carried out at regular intervals. In addition to detailed routine examination of the urine and peripheral blood, determinations of sedimentation rate, hematocrit value, plasma proteins and nonprotein nitrogen, glucose and glucose tolerance and serum electrolytes, including sodium and potassium, were made. An electrocardiogram and a roentgenogram of the chest were made initially and repeated as indicated by the patient's condition. A serological test for syphilis was carried out. The response to pituitary adrenocorticotropic hormone and cortisone was followed by absolute eosinophil counts and changes in the uric acid-creatine ratio, after which sternal marrow and skin biopsies were performed.

5. The low sodium diet of the Presbyterian Hospital contains less than 0.5 Gm. of sodium chloride daily.

6. At the time this study was initiated, the consensus of investigators indicated that 100 mg. of pituitary adrenocorticotropic hormone was comparable to 200 mg. of cortisone. Subsequent study has shown that 100 mg. of pituitary adrenocorticotropic hormone approximates the effect of 250 to 300 mg. of cortisone. Doses of 250 to 300 mg. of cortisone were not employed in this study on the differential effects of pituitary adrenocorticotropic hormone and cortisone in collagen diseases because initial observations indicated to us a qualitative rather than a quantitative differential effect. The increased incidence of undesirable physiological effects with larger doses of cortisone was felt to be a contraindication to these doses.

7. Rose, E., and Pillsbury, D. M.: Lupus Erythematosus (Erythematodes) and Ovarian Function: Observations on a Possible Relationship, with Report of 6 Cases, Ann. Int. Med. **21**: 1022-1034 (Dec.) 1944.

8. Contratto, A. W.: Periarteritis Nodosa: A Report of 2 Cases, One with Special Reference to Sensitivity Factors, Arch. Int. Med. **80**: 567-578 (Nov.) 1947.

9. Fischel, E. E.: The Relationship of Adrenal Cortical Activity to Immune Responses, Bull. New York Acad. Med. **26**: 255-260 (April) 1950.

10. Armstrong, S. H., Jr., and Hawn, C. V. Z.: Personal communication to the authors.

SPECIAL STUDIES

Bacteriology: Pathogens with Respect to Antibiotics.—Because of the frequent association of pyogenic infection in these diseases, bacteriologic study of the flora of the nose, throat, skin, genitourinary tract and colon was made. Of the eight patients with disseminated lupus erythematosus, beta hemolytic streptococci were found in four and beta hemolytic staphylococci in five. A beta hemolytic Streptococcus was also found in the throat of the patient with periarteritis nodosa. Of the remaining seven patients, beta streptococci were found in one and beta staphylococci in four patients.

The sensitivities of these and other organisms isolated to sulfadiazine and the antibiotics, penicillin, streptomycin, chloramphenicol (chloromycetin®) and aureomycin were determined. Before pituitary adrenocorticotropic hormone and cortisone were given, therapy appropriate to these findings was initiated. This was done because it is well known that lupus and other diseases of this group have responded to the removal of an infection, either surgically [7] or by antibiotics.[8] Since antibiotic therapy is comparatively free of complications, we have felt that pituitary adrenocorticotropic hormone and cortisone should be resorted to only after antibiotic treatment has been explored to the fullest extent.

The importance of control of bacterial infection is illustrated by the case summaries of the following two patients referred to us for pituitary adrenocorticotropic hormone and cortisone therapy. In both, there was a beta hemolytic Streptococcus infection which was initially treated with appropriate antibiotics. This proved sufficient to control the disease process, and neither pituitary adrenocorticotropic hormone nor cortisone was given.

N. S., a 70 year old Italian housewife with an acute flare-up of dermatitis herpetiformis, of seven weeks' duration, and beta hemolytic streptococci in the genitourinary tract improved greatly in five weeks on chloramphenicol and estrogen therapy.

G. S., a 40 year old housewife who had the skin rash of disseminated lupus erythematosus for two years, a moderate systemic involvement of one month's duration and beta hemolytic streptococci in the throat has been adequately controlled for five months with penicillin and chloramphenicol.

Immunology: Homologous Agglutinins, Complement Levels.—A hypothesis that suggests an allergic basis for the pathogenesis of the diffuse collagen diseases and some of the dermatoses has been proposed by some. It has also been suggested that the beneficial effects following pituitary adrenocorticotropic hormone or cortisone therapy might be related to an altered immune mechanism brought about by these drugs.[9]

Armstrong and Hawn [10] suggest that this allergy may be due to nonpathogens. In an attempt to determine the relation of bacterial flora to the body immune mechanism, a complete bacteriologic survey of all available mucous membranes was carried out in eight patients of this group as part of a larger survey under the direction of one of us (E. N. I.). Bacterial antigens were prepared from organisms isolated from the patients and tested for homologous patient serum agglutination before, during and after pituitary adrenocorticotropic hormone or cortisone therapy. The antigens tested in-

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cluded those made from beta hemolytic streptococci, beta hemolytic staphylococci, alpha and gamma hemolytic streptococci, other strains of staphylococci and a number of the Neisseria and colon-Aerogenes groups. The results were uniformly negative; no significantly high agglutination titer was encountered, and no significant change was observed after therapy.

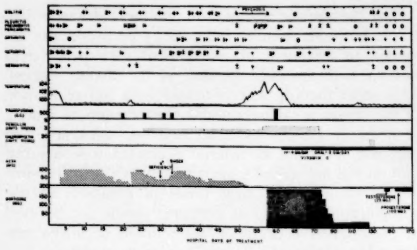

Fig. 1.—Prompt control of disseminated lupus erythematosus with pituitary adrenocorticotropic hormone in patient J. M. Slow control of the relapse which followed was obtained with cortisone.

Because of the recent interest in the relation of serum complement and serologic sequences in the hypersensitive state, as encountered clinically [11] and as experimentally induced (polyarteritis, glomerulonephritis in rabbits),[12] serial complement determinations were carried out during pituitary adrenocorticotropic hormone and cortisone therapy in four patients. In three of these, the levels were within normal ranges (15 to 24 100 per cent hemolytic units). In one of these patients, J. M., the complement level was considerably depressed (2 to 5 100 per cent hemolytic units). The lack of any significant change of complement levels in the course of the clinical improvement seen with pituitary adrenocorticotropic hormone and cortisone therapy suggests that these agents do not act through changing the availability of complement for antigen-antibody reactions that may be involved in the pathogenesis of these diseases.[13]

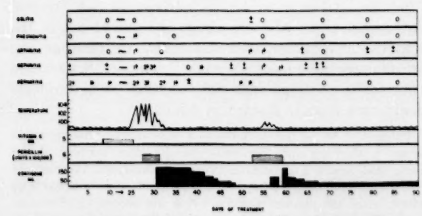

Fig. 2.—Slow control of disseminated lupus erythematosus with cortisone in patient T. R.

Ascorbic Acid-Loading Tests.—Because of the interest recently focused upon ascorbic acid as a possible precursor in adrenocortical hormone production, as well as the better known role of ascorbic acid in maintaining the integrity of supporting substances throughout the body,[14] a study was undertaken of ascorbic acid metabolism in relation to the pituitary adrenocorticotropic hormone and cortisone therapy of diseases characterized by diffuse collagen disturbances. Twelve cases of these diseases were studied by a total of 40 determinations employing a loading test technic [15] in which the changes in blood levels and urinary excretion rates were measured. The test doses of ascorbic acid ranged from 0.25 to 2.00 Gm. Trials were made of both oral and intravenous administration.

Although no correlation was found prior to therapy between the patients' clinical condition and the ability to utilize ascorbic acid, instances were encountered that suggest that the rate of ascorbic acid utilization is increased during the administration both of pituitary adrenocorticotropic hormone and of cortisone. The data are not sufficiently extensive for substantiating statistical treatment. Further standardization of methods and extension of observations will be required for a definitive evaluation.

CLINICAL RESULTS

Lupus: Differences in Response to Pituitary Adrenocorticotropic Hormone and Cortisone.—The first differential effect of pituitary adrenocorticotropic hormone and cortisone therapy emerges from the case histories of J. M. and T. R. Both patients were critically ill with

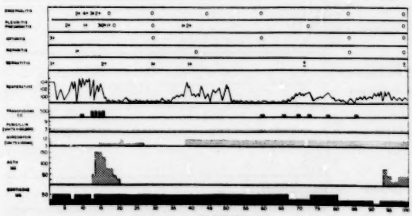

Fig. 3.—Failure to control disseminated lupus erythematosus with cortisone in patient D. E. Prompt remission was obtained with pituitary adrenocorticotropic hormone.

disseminated lupus. J. M. (fig. 1) was given pituitary adrenocorticotropic hormone initially, with signs of rapid remission in two days and general improvement over a period of six days. In contrast, T. R. (fig. 2), a seriously ill boy, when treated initially with cortisone sustained a slow response over a period of 18 days.

The fact that a suboptimal dose of cortisone is of little therapeutic benefit is illustrated by patient D. E. (fig. 3). Dangerously ill, this patient became worse dur-

11. Waring, G. W., Jr., and Weinstein, L.: Effect of Gamma Globulin on Circulating Human Complement, Science **105**: 479 (May 2) 1947.
12. Schwab, L.; Moll, F. C.; Hall, T.; Brean, H.; Kirk, M.; Hawn, C. V. Z., and Janeway, C. A.: Experimental Hypersensitivity in the Rabbit, J. Exper. Med. **91**: 505-526 (May) 1950.
13. The technic used is that in Kolmer, J. A., and Boerner, F.: Approved Laboratory Technic, New York, Appleton-Century-Crofts Company, Inc., 1945, p. 677. The more accurate methods of Mayer and colleagues (Mayer, M. M.; Eaton, B. B., and Heidelberger, M.: Spectrophotometric Standardization of Complement for Fixation Tests, J. Immunol. **53**: 31-35 [May] 1946. Mayer, M. M.; Osler, A. G.; Bier, O. G., and Heidelberger, M.: The Activating Effect of Magnesium and Other Cations on the Hemolytic Function of Complement, J. Exper. Med. **84**: 535-548 [Dec.] 1946) have now replaced Kolmer's method.
14. Wolbach, S. B., and Bessey, O. A.: Tissue Changes in Vitamin Deficiencies, Physiol. Rev. **22**: 233-289 (July) 1942.
15. Chemical Tests and Their Interpretation; Nutrition Surveys: Their Techniques and Value, Committee on Nutrition Surveys, Food and Nutrition Board, Division of Biology and Agriculture, Bull. Nat. Res. Council **117**: 47-81 (May) 1949.

ing 12 days of cortisone therapy (50 mg. daily). On administration of pituitary adrenocorticotropic hormone, the same type of rapid response was seen as in patient J. M. (fig. 1).

The single death encountered in the lupus series was in a patient desperately ill with lupus four days after administration of cortisone, 200 mg. daily. This lack of response can be placed in contrast to the response of patient E. C. (fig. 4), also desperately ill, who sustained a rapid remission in three days on the same dosage of cortisone supplemented by pituitary adrenocorticotropic hormone.

The slowness of response to cortisone can again be illustrated by patient J. M. (fig. 1). When, by reason of a pituitary adrenocorticotropic hormone-induced psychotic episode, it became necessary to discontinue this hormone and subsequently to substitute cortisone, the ensuing relapse rendered the patient dangerously ill. In contrast to the initial 24 hour response to pituitary adrenocorticotropic hormone, seven days passed under cortisone therapy before the temperature came down.

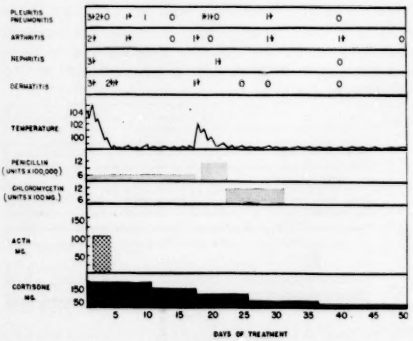

Fig. 4.—Prompt remission of disseminated lupus erythematosus in patient E. C. with combined pituitary adrenocorticotropic hormone and cortisone therapy for three days. The remission was followed by good control with cortisone alone.

The incidence of serious complications on prolonged pituitary adrenocorticotropic hormone therapy is illustrated by the course of J. M. and has led us, in reviewing this group of cases together with other experience with pituitary adrenocorticotropic hormone in this clinic, to use cortisone in holding remissions obtained by pituitary adrenocorticotropic hormone rather than to prolong administration. We do, however, believe that pituitary adrenocorticotropic hormone in initiating remission is the drug of choice. It was our impression that the initial period of pituitary adrenocorticotropic hormone therapy should be about 10 days to two weeks for optimal benefit, because of experience with patient D. E.

The therapeutic regimen of pituitary adrenocorticotropic hormone initially followed by cortisone was extended to treatment of one patient with periarteritis nodosa, with dramatic response of the disease process. This short therapy was instituted with full realization of the severe occlusive arterial phenomenon of healing reported at autopsy by Shick and his colleagues.[16] In our case, evidence of arterial occlusion was manifest only in the left dorsalis pedis artery. We feel that prolonged therapy with large doses of pituitary adrenocorticotropic hormone or cortisone should not be used in polyarteritis because of this marked occlusive tendency during healing.

The problem of sustaining remission, once achieved and maintained with cortisone, is difficult. In patient J. M., with lupus of 12 years' duration, and patient J. McM., after gradual weaning from cortisone, the remissions have been as complete as we have encountered in our experience. On the other hand, in patient T. R. (fig. 2), after discontinuation of cortisone therapy, remissions have not been sustained for more than a month, and we have encountered an exacerbation on an apparently suboptimal dose of cortisone, 50 mg. daily.

The scope of these drugs is illustrated further by patient J. S., a 47 year old salesman with the more localized discoid form of lupus, who underwent satisfactory remission after the combined administration of pituitary adrenocorticotropic hormone and cortisone.

The investigation of the role of steroid hormones other than the adrenal group in sustaining remission (for example, progesterone) is under way and will be reported at a later date.

Scleredema: Lack of Effect of Cortisone; Effect of Pituitary Adrenocorticotropic Hormone.—A second differential effect of these drugs is brought out in the response of a patient with scleredema to cortisone and to pituitary adrenocorticotropic hormone. Scleredema (not to be confused with scleroderma) is a comparatively rare clinical disease in adults.

Patient B. M. in this series was a 60 year old white man in whom a swelling and thickening of the skin, starting at the neck, had begun five months prior to admission. At the end of a month the entire integument was involved in a thickening which, although pliable, was such that the sensation of weight and stiffness of the skin made motion of the extremities difficult for the patient.

In dependent regions of the legs, fluid could be removed from the edema-involved skin with a 22 gage needle, without penetrating into the subcutaneous tissues, in amounts sufficient to permit estimation of protein content by refractometric methods.[17] The initial protein content (2.2 Gm. per 100 cc.) is extraordinarily high for edema fluid.[18]

During 15 days of cortisone therapy on a dosage schedule of 200 mg. a day, there was no significant clinical response. By oversight, redetermination of the protein content of the skin edema fluid was not done at the end of this period.

16. Shick, R. M.; Baggenstoss, A. H., and Polley, H. F.: Effects of Cortisone and ACTH on Periarteritis Nodosa and Cranial Arteritis: Preliminary Report, Proc. Staff Meet., Mayo Clin. **25**: 135 (March 15) 1950.

17. Armstrong, S. H., Jr.; Budka, M. J. E.; Morrison, K. C., and Hasson, M.: Preparation and Properties of Serum and Plasma Proteins: XII. Refractive Properties of Proteins of Human Plasma and Certain Purified Fractions, J. Am. Chem. Soc. **69**: 1747-1753 (July) 1947.

18. In our experience the protein content of fluid in nephrotic or cardiac edema rarely is over 0.5 Gm. per 100 cc. by this method. We have encountered the level seen here prior to therapy only in the presence of such conditions as local infection (which was absent), lymphatic obstruction of the extremities (also absent) and in the subcutaneous fluid in a rare type of iodiopathic hypoproteinemia in which capillary permeability is greatly increased. (Armstrong, S. H., Jr.: Mechanisms of Action of Serum Albumin Therapy in Internal Medicine, Am. J. Med. **4**: 390-397 [March] 1948.) In protein content the fluid resembles that of a second degree burn.

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On pituitary adrenocorticotropic hormone therapy, 100 mg. a day for five days, there was immediate clinical improvement, and measurement of the protein content of the edema fluid showed a striking drop to 0.8 per cent. An attempt at maintenance of this improvement with a cortisone dosage of 50 mg. a day for 10 days was unsuccessful. Further improvement, however, ensued on readministration of pituitary adrenocorticotropic hormone in full dosage.

After demonstration of the ineffectiveness of cortisone, an attempt was made to achieve a pituitary adrenocorticotropic hormone dosage high enough to maintain the skin improvement and yet low enough to avoid the gain of weight (subcutaneous edema) that, despite a low sodium diet and high supplementary potassium intake, has occurred on each occasion in which pituitary adrenocorticotropic hormone has been administered in doses greater than 60 mg. a day. This attempt has been unsuccessful, and the therapy in terms of returning this patient to economic utility has likewise been unsuccessful.

This patient would appear to illustrate a difference in the ability of pituitary adrenocorticotropic hormone and cortisone to influence the permeability to protein of skin capillaries in this condition.

Exfoliative Dermatitis: Lack of Effectiveness of Cortisone; Effectiveness of Pituitary Adrenocorticotropic Hormone in Healing and Problem of Its Side Effects.—The contrast in the healing properties of pituitary adrenocorticotropic hormone and cortisone is further elucidated in a patient with exfoliative dermatitis, whose clinical course also emphasized the importance of the metabolic problems in prolonged pituitary adrenocorticotropic hormone administration, with particular reference to glucose metabolism and electrolyte balance. The sequence of events in this patient is sufficiently important in reference to combined pituitary adrenocorticotropic hormone and cortisone therapy to warrant a detailed report.

L. B., a 58 year old widow, had had intermittent attacks of a deep-seated allergic dermatitis of the exfoliative type for 30 years. The last attack was of 12 months' duration before initiation of pituitary adrenocorticotropic hormone and cortisone therapy; during this time local and general supportive treatment had elicited no significant response. The first course of pituitary adrenocorticotropic hormone, which totaled 3.55 Gm. in 74 days, produced a marked remission in the first month on a dosage schedule of 75 to 100 mg. a day. Because of the development of the syndrome of hypopotassemia (due in part to the fact that the patient was uncooperative in ingesting supplementary potassium), an attempt was made to achieve a dosage low enough to minimize potassium loss and yet high enough to maintain the skin improvement. As in the instance of scleredema described above, this proved unsuccessful. When the dose was reduced to 12.5 mg. a day, exacerbation of the skin lesions followed. After cessation of pituitary adrenocorticotropic hormone, cortisone, 100 mg. daily for nine days, was given in an attempt to control the skin flare-up, with little effect. Control of the dermatitis was once more established with pituitary adrenocorticotropic hormone in full doses (100 mg. daily). Again by reason of effects related to uncontrolled potassium loss and because of disorientation, it became necessary to reduce the dosage. Exacerbation associated with septic complications led to death.

Allergic Dermatitis, Psoriasis: Lack of Effectiveness of Cortisone; Effectiveness of Pituitary Adrenocorticotropic Hormone.—A further contrast between pituitary adrenocorticotropic hormone and cortisone is illustrated by the patient with superficial allergic dermatitis and by the cases of psoriasis associated with arthritis.

V. P., a 35 year old housewife, was first seen with a superficial allergic dermatitis of three weeks' duration associated with arthritis and pyelonephritis. One hundred milligrams of cortisone daily for 10 days resulted in a moderate remission of the arthritis, but the rash became a little worse. Pituitary adrenocorticotropic hormone, 100 mg. daily, with cortisone, 50 mg. daily for five days, brought about marked remission of the rash and other symptoms. The patient was then given 75 mg. of cortisone a day; the pituitary adrenocorticotropic hormone therapy was tapered off gradually, and finally the cortisone was tapered off. In all, the patient received 3.1 Gm. of cortisone in 43 days and 1.5 Gm. of pituitary adrenocorticotropic hormone in 27 days.

A similar response to pituitary adrenocorticotropic hormone and cortisone was observed when these drugs were given to patients with severe psoriasis and arthritis.

N. D., a 31 year old mother, has had psoriasis for 20 years and moderately progressive rheumatoid arthritis for 16 years. Pituitary adrenocorticotropic hormone was started at 100 mg. daily and given for 16 days in a total dose of 1.395 Gm. There was dramatic improvement of the joints, and the psoriasis faded leaving only brown pigment. Two months after therapy, there was some exacerbation of the arthritis and psoriasis. Four months after treatment, the psoriasis had recurred to pretreatment level, and the joints nearly so. A second course of 0.37 Gm. of pituitary adrenocorticotropic hormone in six days gave some remission (fig. 13).

The lack of response to prolonged, sustained doses of cortisone in a patient with psoriasis and arthritis is in striking contrast to the response in the patient treated with pituitary adrenocorticotropic hormone as cited above.

M. C., a 52 year old man, has had crippling rheumatoid arthritis for 13 years associated with marked psoriasis covering almost the entire body. The skin was weeping, and beta hemolytic staphylococci were found on the skin and mucous membranes of the nose and throat. The patient received 100 mg. of cortisone daily for two weeks, and 50 mg. daily for an additional two weeks. The joints improved somewhat, but the skin and general condition deteriorated. After this, the patient's general condition improved on six weeks of penicillin and supportive therapy, but the psoriasis remained active. On 100 mg. of pituitary adrenocorticotropic hormone daily, there was dramatic improvement in four days.

In the accompanying table the differences in clinical response to these drugs are given for each of the diseases studied.

CHANGE IN LABORATORY FINDINGS ON THERAPY

Lack of Correlation Between Eosinophil Response and Clinical Response to Pituitary Adrenocorticotropic Hormone and Cortisone.—Whereas in general on pituitary adrenocorticotropic hormone-cortisone therapy this group of patients showed the drop in eosinophil count described by Thorn and his co-workers,[19] exceptions to this rule were sufficiently numerous that the eosinophil response cannot, in our opinion, be used as evidence in any patient of whether clinical improvement is to be anticipated from therapy. The most notable

19. Thorn, G. W.; Forsham, P. H.; Prunty, F. T. G., and Hills, A. G.: A Test for Adrenal Cortical Insufficiency: Response to Pituitary Adrenocorticotropic Hormone, J. A. M. A. **137**: 1005-1009 (July 17) 1948.

lack of eosinophil response was encountered in patients J. M. (lupus, fig. 1), T. R. (lupus, fig. 2) and B. M. (scleredema). It is of interest that all these patients had initial low absolute eosinophil counts, below 100 per cubic millimeter. In these three patients, either no drop or a rise in the number of circulating eosinophils followed therapy, despite the clinical response encountered and, in the instance of B. M., despite a rise in uric acid-creatinine ratio on initiation of each new course of pituitary adrenocorticotropic hormone. Again, patient L. B. showed on her initial course of pituitary adrenocorticotropic hormone a striking drop in eosinophils correlated with clinical improvement. However, on subsequent courses of therapy no similar drops were encountered.[20]

These findings do not wholly substantiate the tentative interpretation of Randolph and Rollins [21] that "the failure of eosinophils to diminish markedly . . . from the peripheral circulation during the first 24 hours of ACTH therapy is commonly associated with a clinically inadequate therapeutic response."

These findings also emphasize the fact that in attempting to get definitive evidence of adrenal response in initiating pituitary adrenocorticotropic hormone therapy, it is wise to rely on more evidence than is afforded by the eosinophil response alone.

Summary of Differential Clinical Effects of Pituitary Adrenocorticotropic Hormone and Cortisone

		ACTH			Cortisone		
Patient	Disease	Total Dose, Gm.	No. of Days	Results	Total Dose, Gm.	No. of Days	Results
J. M.	Disseminated lupus erythematosus	3.07	48	Rapid general improvement in 6 days	....	..	.....
					5.59	59	Slow improvement in 2 months
T. R.	Disseminated lupus erythematosus	....	..	.....	3.4	18	Slow good control in 17 days
		....	..	.....	....	..	Relapse
		....	..	.....	1.58	28	Slow good control in 1 month
D. E.	Disseminated lupus erythematosus	....	..	.....	0.55	11	Condition worse
		0.75	7	Marked remission in a critically ill patient in 1 week	....	..	.....
		....	..	.....	3.525	87	Slow improvement but still activity
E. C.	Disseminated lupus erythematosus	0.32	3	Marked remission of rash and mouth ulceration in 3 days	4.9	63	Continued slow improvement
J. McM.	Disseminated lupus erythematosus	....	..	.....	4.575	47	Cleared in 1 month; pleural effusion developed 2 weeks after therapy; this cleared
P. R.	Disseminated lupus erythematosus	0.7	9	Prompt remission in 5 to 7 days	2.65	26	Asymptomatic
V. F.	Disseminated lupus erythematosus	....	..	.....	0.6	3	Died
J. S.	Discoid lupus erythematosus	1.38	16	Marked remission in 10 days	....	..	.....
		....	..	.....	2.3	27	Continued remission
B. M.	Scleredema	....	..	.....	3.0	15	Slight improvement of arthritis and skin
		0.5	5	Marked remission in 5 days	....	..	.....
		....	..	.....	1.0	10	Minimal regression
I. W.	Periarteritis nodosa	1.2	14	Prompt remission in 5 days	2.7	24	Asymptomatic
L. B.	Exfoliative dermatitis	3.55	74	Immediate response with marked remission in 1 mo.; regression on smaller doses	....	..	.....
		....	..	.....	1.0	9	No effect
		1.163	25	Moderate remission in 1 week	....	..	.....
V. P.	Allergic dermatitis	....	..	.....	1.0	10	Rash worse
		1.5	27	Marked remission in 5 days	....	..	.....
		....	..	.....	2.1	33	Sustained remission
N. D.	Psoriasis and arthritis	1.395	16	Marked remission	....	..	.....
		....	..	Relapse in 4 months	....	..	.....
		0.37	6	Moderate remission	....	..	.....
M. C.	Psoriasis and arthritis	....	..	.....	2.1	28	No effect on psoriasis; mild remission of arthritis
		0.7	7	Marked remission of psoriasis	....	..	.....

Leukocytosis Unexplained by Intercurrent Infection.—In those "diffuse collagen diseases" (for example, lupus) characterized by leukopenia, a shift was observed to moderate leukocytosis during the administration of pituitary adrenocorticotropic hormone-cortisone therapy, and a return to the leukopenia constituted an early sign of exacerbation on decreased amounts of drug. In two instances, the leukocyte count became quite high (20,000 to 35,000). The cells were predominantly mature polymorphonuclear leukocytes.

20. It is of interest that the initial eosinophil drop occurred when the pretreatment level was approximately 300 per cubic millimeter, and the failure of drop was encountered when the pretreatment level was below 100 per cubic millimeter.

21. Randolph, T. G., and Rollins, J. P.: Eosinophil Observations in Adrenocorticotropic Hormone (ACTH) Therapy, in Mote, J. R.: Proceedings of the First Clinical ACTH Conference, Philadelphia, The Blakiston Company, 1950, pp. 1-13.

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Search for infection to explain this leukocytosis was unavailing in these patients.[22]

Other Laboratory Evidence of Improvement.—Albuminuria, hematuria and cylindruria diminished or cleared in all patients studied. Abnormal plasma proteins, as evidenced by decreased total protein and increased globulin fractions, showed various degrees of reversion to normal. The erythrocyte sedimentation rate, which was elevated in all patients studied, became reduced in all instances. It fell to normal limits in only two patients.

COMPLICATIONS OF PITUITARY ADRENOCORTICOTROPIC HORMONE AND CORTISONE THERAPY

Salt and Water Retention.—Moderate to marked water retention manifested by rapid weight gain and edema developed in nine of these patients, despite rigorous adherence to the low sodium diet previously described. We have not noted disappearance of this tendency toward sodium retention on prolonged therapy, although we have encountered patients in this and other series under study in the hospital who, on full

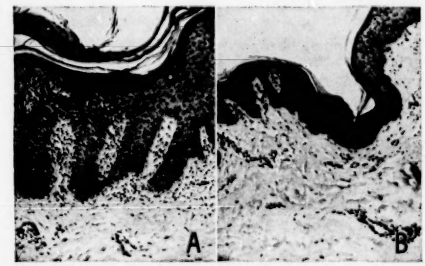

Fig. 13.—Psoriasis in patient N. D. *A*, prior to treatment. *B*, 16 days after therapy with pituitary adrenocorticotropic hormone. There is a decrease in acanthosis and a diminished number of inflammatory cells in the corium. Microabscesses of Monroe have disappeared.

dosage of pituitary adrenocorticotropic hormone and/or cortisone, do not manifest a striking tendency towards salt and water retention. When severe, salt and water retention can constitute a serious complication of therapy.

Precautions Necessary in Control of Salt and Water Retention by Mercurial Diuretics: In most instances, mercurial diuretics have been successful in controlling excessive edema. In the successful instances, as much as 700 or 800 milliequivalents of sodium, as determined by the flame photometer, have been excreted along with the water loss on a daily intake of between 20 and 50 milliequivalents.

Baehr and Soffer [3] have reported mercurial diureses of water without any increase of urinary sodium output and with a moderate increase of urinary excretion of potassium. We have confirmed this finding in two instances of administration of mercurials to patients under therapy. Such a diuresis, far from improving the clinical state of the patient, has in one instance assisted in bringing on the distressing syndrome of potassium insufficiency. It is therefore recommended that whenever possible the sodium and potassium outputs, or at least the chloride output before, during and after mercurial diuresis be checked in each patient, and when symptoms of unusual weakness or other manifestations of potassium insufficiency are encountered, mercurials be abandoned and the question of reduction or, indeed, discontinuance of the pituitary adrenocorticotropic hormone or cortisone therapy be considered seriously.

Syndrome of Potassium Deficiency.—In two patients in this series the syndrome of serious potassium insufficiency has been encountered.[23] The symptoms include muscle weakness, cardiovascular collapse with associated electrocardiographic changes and, at times, a striking amount of abdominal distention, cramps and pain. This latter feature has raised the question of surgical abdominal emergency. The differential diagnosis has been rendered more difficult by the leukocytosis encountered in patients on pituitary adrenocorticotropic hormone and cortisone therapy. In the full-blown syndrome, the lack of localizing signs of peritoneal irritation, together with a lowered serum potassium (in this series between 1.8 and 2.5 milliequivalents per liter) have aided in differentiation.

In the prevention of this syndrome, it is important to realize that the serum potassium falls late. Many days of urinary loss of potassium precede the development of clinical symptoms and the drop of serum potassium to abnormal levels.

By way of prevention, the oral intake noted in the introduction, namely up to 6 Gm. of potassium chloride or potassium bicarbonate a day, has been sufficient to avert the complications. In one instance, the development of potassium deficiency was shown to be related to lack of cooperation of the patient in ingesting the administered pills.[24] In another patient with long-standing severe illness, the complication developed despite supplementary potassium therapy.

Once developed, potassium deficiency is difficult to treat. Where abdominal symptoms are striking, oral ingestion of supplementary potassium is not well tolerated even in the enteric-coated form. Potassium chloride intravenously in solutions more concentrated than 3 per cent has given rise to painful venous spasm, and, even when administered in 3 per cent solution, it has frequently been necessary to relieve concomitant pain with meperidine (demerol®) hydrochloride.

Moreover, in a patient who has been under pituitary adrenocorticotropic hormone and/or cortisone therapy, a large proportion of intravenously administered potassium tends to appear in the urine. Although it is usually possible to obtain amelioration of symptoms by 15 to 30 Gm. of potassium chloride intravenously over a period of 24 hours, it is important to increase supplementary oral potassium as soon as is feasible.

22. Dr. Louis R. Limarzi, Associate Professor of Medicine, University of Illinois College of Medicine, made careful bone marrow studies on three of our patients who had disseminated lupus. Dr. Limarzi reported moderate to marked bone marrow stimulation following treatment with pituitary adrenocorticotropic hormone, cortisone, or both, and the presence of L. E. cells, clumping of the neutrophils, or both, even after therapy.

23. These patients are in addition to other patients with the syndrome under observation in this clinic during the past year.

24. In one patient with incipient but not fully developed potassium insufficiency, cause was found in the presence of undisintegrated potassium chloride tablets in the stools.

We have encountered the syndrome of potassium deficiency on doses of pituitary adrenocorticotropic hormone as small as 15 mg. a day in five divided doses. In patient L. B., with exfoliative dermatitis, it proved impossible to achieve a dosage which would control skin manifestations and still avoid potassium deficiency. The latter syndrome was in the main responsible for the ultimate discontinuance of the drug and certainly in part responsible for death.

Sweating.—Patients on prolonged cortisone therapy exhibited a tendency to constant cold perspiration, which bore little apparent relationship to any other factors.

Cushing's Syndrome.—One or more of the features characteristic of Cushing's syndrome developed in 10 of the 13 patients. The features observed were glycosuria in six patients, increased sugar tolerance curves in four patients, hyperpigmentation in nine patients, a rounded face and redistribution of fat to the lower cervical spine and abdomen in eight patients, acne in five patients and hypertrichosis in 3 patients. These changes occurred in both sexes, but the change in physical habitus was more pronounced in women than in boys or men. However, when use of the drug was discontinued, there was a return toward a more normal condition.

Psychological Side Effects.—The effect of pituitary adrenocorticotropic hormone and cortisone on the higher nervous centers noted by many previous workers was striking in these patients. Certain of these manifestations were in no way detrimental to therapy. Thus, all patients felt a moderate to marked increased sensation of well being.

Of serious import with relation to continued pituitary adrenocorticotropic hormone therapy were episodes of severe depression, hypomania or frank schizoid psychoses, which were encountered in five patients in this series. Such episodes were observed only in pituitary adrenocorticotropic hormone therapy, and in our experience they constitute an immediate indication for discontinuation of the drug. Subsequent cortisone therapy has been successfully used without recurrence of the psychoses.

As has been observed by other workers,[25] the type of serious psychotic manifestation appears related to the underlying psychological structure of the patient under treatment. Thus, the content of the apparently delusional ravings of one of these patients in a reaction approaching schizoid panic bore, on detailed interview by one of us (S. H. A. Jr.), a very clear relation to previously inexpressible hostilities in a difficult familial situation. In the first week of regression of the panic and better contact with reality on withdrawal of pituitary adrenocorticotropic hormone, the patient expressed, directly and indirectly, to the doctor great fear at the revealing character of the discussion which had taken place during the panic. From the second through the fourth week, at which time the patient's usual adjustments to daily life had returned, complete obliteration of memory for the episode had ensued.

The sequence of events in this patient serves to illustrate the length of time occasionally required for subsidence of the psychological manifestations following pituitary adrenocorticotropic hormone withdrawal.

25. Hoefer, P. F. A., and Glaser, G. H.: Effects of Pituitary Adrenocorticotropic Hormone (ACTH) Therapy: Electroencephalographic and Neuropsychiatric Changes in 15 Patients, J. A. M. A. **143**: 620-624 (June 17) 1950.

SUMMARY

Clinical and laboratory observations are reported on a total of 13 patients with "diffuse collagen disease" and certain other chronic diseases, chiefly localized to the skin, under therapy with pituitary adrenocorticotropic hormone and cortisone, with a view to analysis of the differences in action of these agents and to the handling of complications of therapy. One death was encountered, due in part to the complications of long term therapy and one death was possibly due to insufficient initial therapy.

Clinical results indicate that in selection of patients for therapy, thorough bacteriologic study and attempt at antibiotic control of infections should precede use of pituitary adrenocorticotropic hormone and cortisone, except in the instance of dangerously ill patients with lupus erythematosus.

Certain striking differences were noted between the effects of pituitary adrenocorticotropic hormone and cortisone in this group of diseases. In disseminated lupus, pituitary adrenocorticotropic hormone appears to have induced faster remissions, but because of the high incidence of complications on long term therapy with the hormone, remissions, once obtained, appear best held on cortisone. The problem of weaning from cortisone is discussed.

In certain chronic dermatoses, such as exfoliative dermatitis, psoriasis and scleredema, cortisone in doses up to 200 mg. daily appears to be without effect on the healing process in contrast with the striking effect of pituitary adrenocorticotropic hormone. It has been difficult to achieve a dosage of the hormone sufficient to control skin manifestations in these conditions and yet free of untoward side effects in long term therapy.

The problems of management of the serious complications of long term therapy are discussed in terms of salt restriction and the use of mercurial diuretics in patients retaining salt and water, in terms of administration of supplementary potassium and the development of the syndrome of potassium deficiency, in terms of the development of Cushing's syndrome and in terms of the psychotic complications of pituitary adrenocorticotropic hormone therapy, which were not encountered with cortisone.

The experience with this series of patients, in addition to experience with other patients under study in this clinic, leads us to believe that although short term therapy (two weeks or under) with pituitary adrenocorticotropic hormone can be carried out safely under a proper regimen without extensive laboratory control, long term therapy with the hormone demands the availability of the laboratory and other facilities of a medical center for safe use. Long term cortisone therapy, by reason of diminished incidence and severity of complications, is more subject to general use.

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No instance of permanent cure in these conditions was observed, despite the fact that frequently, particularly in lupus erythematosus, therapy appeared life saving.

Serial skin biopsies carried out before, during and after therapy in these patients in general correlated well with clinical evidence of improvement, but in no case was there evidence of complete reversion to normal. Atrophy of the superficial layer of the corium, inflammatory infiltrate, disorientation of the collagen bundle and eosinophilic infiltrate were the common variables seen to alter during therapy.

CONGENITAL VASCULAR ANOMALIES

Captain Acors W. Thompson, Medical Corps
United States Army
and
June C. Shafer, M.D., Arlington, Va.

Congenital vascular anomalies involving relatively superficial sites present wide variations in clinical manifestations. These lesions include the commonly observed capillary or cavernous hemangiomas of the infant and unusual abnormalities of the adult which offer difficult but stimulating problems in their evaluation. A complex terminology has been applied to arteriovenous and venous malformations. One trend has been to describe these lesions only as hemangiomas; on the other hand, a classification has evolved on the basis of descriptive regional involvement or by an eponymic nomenclature. The following review correlates only the most widely used terms, since it is useless to attempt a summary of minor variants.

Among the terms used to designate the syndromes produced by congenital arteriovenous communications are arteriovenous fistula, arteriovenous aneurysm, angioma arteriale, pulsating venous aneurysm, angioma cavernosum, arteriovenous varix, aneurysm by anastomosis, cirsoid aneurysm and racemose hemangioma. These have arisen largely through clinical descriptions, but there is some agreement that the fundamental pathological process is essentially the same. Rienhoff,[1] Lewis,[2] Seeger,[3] Horton [4] and others have described congenital arteriovenous fistulas.

The term phlebarteriectasia has been used to designate a complex syndrome associated with "diffuse dilatations of arteries and veins." [5] Some authors feel that phlebarteriectasia is produced by multiple small arteriovenous fistulas.[6] A related clinical picture is hemangiectatic hypertrophy (Parkes Weber syndrome)[7] which closely parallels the Klippel-Trenaunay syndrome [8] described in the French literature and emphasizes the presence of superficial vascular hamartomas, varicose veins and hypertrophy of the involved extremity. In some patients Parkes Weber associated the enlargement of the long bones with an increased arterial blood supply.

A venous anomaly, designated as phlebectasia (diffuse genuine phlebectasia), with no demonstrable evidence of abnormal arteriovenous communications, presents significant enlargement of venous channels, often over an entire part. Phlebectasia was reported first in detail by Bockenheimer [9] in 1907 and later by Sonntag,[10] Bode [11] and other German and Japanese investigators. Case studies by Freund [12] and by Kert and Grishman [13] are available in the American literature. Phlebectasia resembles the anomalies described by Allen, Barker and Hines [14] as diffuse systemic hemangioma. These authors state that while certain diffuse systemic hemangiomas may present evidence of congenital arteriovenous fistulas, others occur without these signs, even in adults. This latter group appears closely related to phlebectasia, which may also be a variant of a cavernous hemangioma or cavernoma.

Other carefully described congenital malformations associated with vascular anomalies are retinal, cerebellar and visceral angiomatosis (von Hipple-Lindau syndrome), and nevus flammeus of the face with cerebral angiomatosis, hemiplegia and mental retardation (Sturge-Weber syndrome).[15] The vascular hamartomas occurring with dyschondroplasia (Maffucci's syndrome) have been well reviewed by Carleton, Elkington, Greenfield and Robb-Smith.[16] In the patients studied by these authors, the vascular patterns are of interest, since extensive phlebectasia was observed with sufficient frequency to warrant emphasis. Among the vascular malformations, hereditary hemorrhagic telangiectasia has been shown to have a genetic inheritance factor. Instances, however, have been reported of the occasional familial occurrence of these other clinical syndromes.[7b]

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From Walter Reed General Hospital: Medical Service (Captain Thompson); Civilian Attending Physician, Department of Dermatology and Syphilology (Dr. Shafer).

Dr. Andrew G. Prandoni, Civilian Attending Physician, Walter Reed General Hospital, made available two case studies, and Mr. F. William Miller provided technical assistance.

1. Reinhoff, W. F.: Congenital Arteriovenous Fistula: An Embryological Study with the Report of a Case, Bull. Johns Hopkins Hosp. **35**: 271 (Sept.) 1924.

2. Lewis, D. D.: Congenital Arteriovenous Fistulae, Lancet **2**: 621 (Sept. 20) 1930.

3. Seeger, S. J.: Congenital Arteriovenous Anastomoses, Surgery **3**: 264 (Feb.) 1938.

4. Horton, B. T.: Hemihypertrophy of Extremities Associated with Congenital Arteriovenous Fistula, J. A. M. A. **98**: 373 (Jan. 30) 1932.

5. McNealy, R. W.: Aneurysms, in Lewis, D.: Practice of Surgery, Hagerstown, Md., W. F. Prior Co., Inc., 1948, vol. 12, chap. 5-E, p. 1.

6. Krauspe, C.: Zur pathologischen Anatomie der genuinen diffusen Phlebarteriektasie, Zentralbl. f. Chir. **68**: 727 (April 19) 1941. Blumgart, H. L., and Ernestene, A. C.: Hemangiectatic Hypertrophy and Congenital Phlebarteriectasis, Arch. Int. Med. **49**: 599 (April) 1932.

7. (*a*) Weber, F. P.: Hemangiectatic Hypertrophy of Limbs, Brit. J. Child Dis. **15**: 13 (Jan.-March) 1918. (*b*) Rare Diseases and Some Debatable Subjects, London, Staples Press, Ltd., 1947.

8. Servelle, M.: La veinographie va-t-elle nous permettre de démembre le syndrome de Klippel et Trénaunay et L'hémangiectasie hypertrophique de Parkes Weber? Presse méd. **26**: 353-354 (June 30) 1945.

9. Bockenheimer, P.: Ueber die genuine diffuse Phlebektasie der oberen Extremität, Leipzig, Festschrift G. E. v. Rindfleisch, 1907.

10. Sonntag, E.: Das Rankenangiom, sowie die genuine diffuse Phlebarteriektasie und Phlebektasie, Ergebn. d. Chir. u. Orthop. **11**: 99-182, 1919.

11. Bode, H. G.: Über die genuine diffuse phlebektasie, insebesondere über ihre Beziehungen zum arteriellen und venösen Rankenangiom sowie zur genuinen diffusen: Phlebarteriektasie, Med. Klin. **33**: 1164-1170 (Aug.) 1937.

12. Freund, E.: Diffuse Genuine Phlebectasia: Report of Case, Arch. Surg. **33**: 113-121 (July) 1936.

13. Kert, M. M., and Grishman, A.: Diffuse Genuine Phlebectsia, J. Mt. Sinai Hosp. **11**: 278-281 (Jan.-Feb.) 1945.

14. Allen, E. V., Barker, N. W., and Hines, E. A.: Peripheral Vascular Disease, Philadelphia, W. B. Saunders Company, 1946, 546 pp.

15. Bucy, P. C.: Intracranial Neoplasms, in Grinker, R. R.: Neurology, ed. 4, Springfield, Ill., Charles C Thomas, Publisher, 1949, chap. 12.

16. Carleton, A.; Elkington, J. S.; Greenfield, J. G., and Robb-Smith, A. H. T.: Maffucci's Syndrome: Dyschondroplasia with Haemangiomata, Quart. J. Med. **11**: 203-228 (Oct.) 1942.

PATHOGENESIS

Congenital vascular malformations arise from mesodermal dysplasias, and the complexities occurring in their embryologic development account for the variations in their final clinical picture.

The detailed studies by Sabin [17] emphasized that blood vessels spread over the developing embryo in definite sheets of capillaries. In these primitive vessels, after circulation began, a certain vessel could serve as an artery and then be reduced to a capillary plexus, in which the direction of the circulation was entirely different from that of the original vessel. Again, a vessel could serve as a vein and subsequently receive new arterial connections and become an arterial plexus with the flow of blood entirely changed. Sabin stressed the importance of understanding the function of vessels at each stage in their development.

In his study of the development of the primitive arterial systems in the forelimb of the pig, Woollard [18] described three phases to be distinguished in the formation of an individual arterial tube: (1) the stage of the capillary net; (2) the retiform stage, characterized by enlarged tubes showing island formation, coalescence and tendency to fuse, and (3) the formation of a definite stem. Woolard agreed that the primordium of the vascular system was present in the vascular net, which depended on the inherent properties of certain cells to form blood vessels and blood cells. These properties were regulated by the needs and the activities of the surrounding tissue and carried no implication of the future pattern of the vessels.

An abnormal development of arteries and veins from the capillary plexus would seem to afford the chief explanation of the occurrence of vascular anomalies. Reid [19] believed that some angiomas resulted from abnormal arteriovenous communications that persisted, as arteries and veins developed from their common capillary bed. McNealy [5] and DeTakats [20] emphasized that the type of vascular anomaly produced depended on the stage in which embryologic arrest occurred. Ewing [21] stated that, while mechanical factors were important in determining the course of the angiomas, their origin depended on developmental anomalies in the vascular segments, which retained embryonal characteristics.

The histological differences will not be discussed in this paper, since there is no general agreement as to whether hyperplasia or neoplasia, or both, occur in the development of such vascular lesions.

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22. Holman, E.: Arteriovenous Aneurysm: Abnormal Communications Between the Arterial and Venous Circulations, New York, The Macmillan Company, 1937.

CLINICAL DESCRIPTION

All types of vascular anomalies have been reported to occur most frequently in the vessels of the head and neck or extremities. Among the deep sites which have also shown involvement are the pulmonary, hepatic and renal vessels. In the majority of patients clinical manifestations are apparent at birth or shortly thereafter, although lesions may become evident at any time during the first four decades of life. In this later group, while trauma has often been considered the causative factor, because of the rapid onset of symptoms subsequent to injury, actually it serves only as a precipitating agent.

Congenital arterial aneurysms are rare and have tended to involve deep vessels. Certain lesions may lie dormant, while others create an embarrassment either by encroachment on contiguous structures or by hemorrhage from rupture.

Congenital arteriovenous fistulas do not present a common and well defined clinical picture, the variability of their clinical findings being determined by the location, number and size of the fistulas. Lesions occur in the vessels of the head and neck or the viscera and frequently in the extremities. Clinically the presence of a fistula involving an extremity may be indicated first by the presence of unilateral distended veins, not necessarily tortuous or incompetent but suggestive of increased venous pressure. Superficial hemangiomas may occur locally or over widespread areas and are often present long before there is other clinical evidence of a fistula. A pulsating vascular mass may be palpable; more commonly, thrills and bruits are demonstrable. Skin temperature over the fistula and the affected limb may be elevated as much as 9 degrees (F.) or more when compared with the unaffected side. Hypertrichosis and hyperhidrosis may be observed. If the fistula is functioning before the epiphysial centers are closed, hemihypertrophy may result. Late effects include cutaneous atrophy and chronic ulceration. In occasional patients the persistence of single or multiple large major vascular stems may produce symptoms simulating those produced by a traumatic arteriovenous fistula.

The systemic effects produced by arteriovenous fistulas have been described by Holman.[22] These are dependent on the size of the fistula and its effect on the circulatory system.

Occasional patients are seen with variants of this vascular picture. The widespread superficial hemangiomas with hypertrophy of the affected limb, venous sinusoids, ulceration and, occasionally, gangrene have been identified by some authors as phlebarteriectasia. Clinical evidence of abnormal arteriovenous communications, such as pulsations, thrills or bruits, is often lacking. In those patients with abnormal arteriovenous communications, venous oxygen saturation studies will identify the presence of fistulas; others with identical clinical pictures appear to be purely capillary and venous anomalies.

A venous malformation, identified by some as phlebectasia, presents gradually developing, multiple, spongy, bluish, irregular venous sinusoids, often first appearing clinically during childhood. The vascular channels may vary considerably in size but are usually

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1 to 5 cm. in diameter. The venous pattern is bizarre and does not conform to the normal anatomic distribution. A part of or an entire extremity are the usual sites of involvement, but other areas, such as the face and abdomen, have been reported.[12] Cutaneous changes, such as atrophy or ulceraion, may be present; an increase in skin temperature may be noted. In occasional patients changes in osseous growth occur as either hypertrophy or atrophy. The musculature in the area may become atrophic because of disuse or pressure from the vascular mass. No detectable changes in venous pressures are observed.

Phlebectasia is to be differentiated from the varicose vein complex, in which the veins are usually uniformly dilated and tortuous and follow the normal anatomic distributions. Arteriovenous fistulas may so closely simulate phlebectasia that oxygen determinations are necessary for diagnosis. The differentiation from cavernous hemangiomas is not sharp, and these lesions may be identical with those cavernous hemagiomas that do not undergo early fibrosis.

DIAGNOSTIC PROCEDURES

Since the clinical picture alone is often not sufficient for the determination of the character of vascular anomalies, certain technical procedures may provide supplementary data. Of these, roentgenographic visualization of vessels with a radiopaque medium (iodopyracet injection) injected directly into the arterial or venous systems of an involved area is a great diagnostic aid.

Arteriography is of greatest value in the diagnosis of an arteriovenous fistula, although roentgenographic characteristics may not be recognizable in all instances. In only those lesions with relatively few large shunts may specific features be obvious and pathognomonic. Allen and Camp [23] have reported three common characteristics: (1) dilatation of the arteries leading to the fistula, (2) absence of normal arteries distal to the fistula and (3) pooling of the arteriographic medium in the region of the fistula. Another important feature to be evaluated only with the performance of the procedure is the increased rapidity of filling in the venous system. Large masses of vascular tissue, when visualized by this method, reveal little definitive information other than the extent of the lesion. An arteriogram showing no abnormalities usually eliminates the presence of a pathological arterial lesion.

Phlebography in the presence of an arteriovenous fistula will demonstrate only venous dilatation and tortuosity both proximal and distal to the site of the lesion. Congenital anomalies involving venous segments may present three common characteristics: (1) large sinusoidal collections of radiopaque substance, (2) irregularity in the caliber of the veins and (3) clusters of minute collections of radiopaque material scattered irregularly throughout the involved area. Phleboliths may be demonstrable in the soft tissue of the involved area. Dilatation and tortuosity of veins are of little diagnostic importance, since these may occur in the varicose vein complex.

Measurement of the oxygen saturation of venous blood is an aid in the differentiation of congenital arteriovenous fistulas from other vascular anomalies. An increase in oxygen saturation of venous blood is indicative of a fistula.[24]

Skin temperature measurements are of value, since arteriovenous lesions produce local increases in temperature. Readings over venous lesions may also be elevated, but the rise is not usually so great.

Venous pressure determinations show elevation in the segments adjacent to an arteriovenous fistula; in contrast, there is no alteration in phlebectasia. A simple method is the simultaneous elevation of the involved and uninvolved extremities, with comparison of the level at which veins collapse.

REPORT OF CASES

The following patients with vascular malformations have been evaluated clinically and by the described laboratory studies.

CASE 1.—A white woman, a housewife aged 27 was seen in February 1947, with aching and numbness of the right arm, increasing gradually since 1944. Pain was accentuated by cold and dampness and relieved by warmth; twisting the head or arms did not cause its aggravation. No history of trauma could be elicited. Large, distended veins had been observed in the right arm since childhood. Physical examination revealed the upper extremities to be symmetrical and normal in size. There was obvious dilatation of the veins on the dorsum of the right hand and the volar surface of the forearm. Abnormal pulsation was palpable on the palmar surface of the right hand; other peripheral arterial pulsations were equal. On simultaneous elevation of the upper extremities, distention of the veins on the right continued above those on the left. No thrills or bruits were present. Attempts to identify a possible scalenus anticus syndrome were unsuccessful. The bradycardic reaction was negative. Blood pressure was 110/76 (mm. Hg.). Skin temperature readings are shown in table 1.

TABLE 1.—*Skin Temperature (Fahrenheit) Readings in Case 1*

Region of Upper Extremity	Right Side	Left Side
First finger	91.0	85.3
Palmar surface, hand	91.0	87.8
Dorsal surface, hand	90.1	86.7
Volar surface, arm	92.5	90.3

The venous oxygen saturation for the right arm was 94 per cent and the left arm (control) 30 per cent. Roentgenograms showed the cardiac silhouette and the bones of the hand to be normal. An arteriogram revealed no definitive information. The electrocardiogram was normal. The diagnosis was congenital arteriovenous fistulas involving palmar vessels of the right hand, associated with symptoms similar to causalgia.

CASE 2.—A white woman, a housewife aged 30, was seen in July 1947, with a vascular mass in the palm of the right hand, where a nevus flammeus had first been noticed during early childhood. Its size had remained unchanged until the patient was 18, when the lesion enlarged; swelling increased gradually and was pronounced during two normal pregnancies. No regression followed either delivery. For the two preceding years there was no appreciable alteration in the size of the lesion. The only complaint was the unsightliness of the mass. No history of trauma could be elicited. Physical examination revealed an elevated, pulsating, compressible vascular mass

23. Allen, E. V., and Camp, J. D.: Arteriography: A Roentgenographic Study of the Peripheral Arteries of the Living Subject Following Their Injection with a Radio-Opaque Substance, J. A. M. A. **104**: 618-623 (Feb. 23) 1935.

24. Brown, G. E.: Abnormal Arteriovenous Communications Diagnosed from the Oxygen Content of the Blood of the Regional Veins, Arch. Surg. **18**: 807-810 (March) 1929. Veal, J. R., and McCord, W. M.: Congenital Abnormal Anastomoses of the Extremities with Special Reference to Diagnosis by Arteriography and by the Oxygen Saturation Test, ibid. **33**: 848-866 (Nov.) 1936.

(3.5 by 2.5 cm.) in the palm of the right hand. The superficial veins of the thenar eminence, dorsum of the hand and forearm were dilated. Both upper extremities were of equal size and normal contour. On palpation the right radial and ulnar pulses were increased in comparison with the left. A thrill and a bruit with both systolic and diastolic components were noted in the region of the mass. Compression of both the radial and ulnar arteries resulted in cessation of the bruit, but compression of either one was insufficient for complete suppression. The bradycardiac reaction was negative. Blood pressure was 110/78 (mm. Hg.). Skin temperature readings are given in table 2.

The venous oxygen saturation for the right arm was 92.7 per cent and the left arm (control) 39.3 per cent. Roentgenograms revealed a normal cardiac silhouette. There was no apparent erosion or alteration in the size of the bones of the right hand. An arteriogram (fig. 1) revealed a large mass of dilated and tortuous vessels in the hand, with an arteriovenous shunt involving the superficial arch and its venae comitantes. The radial and ulnar arteries were dilated. The electrocardiogram was normal. The diagnosis was congenital arteriovenous fistulas of the right hand.

TABLE 2.—*Skin Temperature (Fahrenheit) Readings in Case 2*

Region of Hand	Right Hand	Left Hand
First finger	89.2	81.2
Fifth finger	85.2	80.2
Palmar surface	97.0	88.3

CASE 3.—A white woman, a housewife aged 25, was admitted in June 1949. In 1944 she had first observed a flat, asymptomatic red mark in the palm of the right hand. Two weeks prior to admission, after spanking her son vigorously, she experienced a stabbing pain in the region of the mark and three days later observed the gradual appearance of a mass in the same area with a drawing sensation in the palm and forearm. No other birthmarks had been noted. Physical examination revealed a reddish, pulsating mass (1.5 by 1 cm.) in the right palm. Its size was diminished when the radial and ulnar arteries were abolished by digital pressure. The veins over the palmar surface of the right hand were prominent.

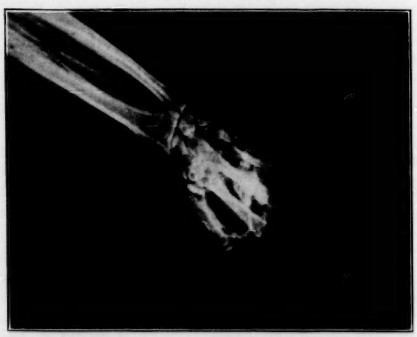

Fig. 1 (case 2).—Congenital arteriovenous fistulas. Arteriogram shows dilatation of arteries proximal to lesion, pooling of contrast medium at the site of the fistula and failure of vessels distal to fistula to fill with contrast medium.

Both arms were equal in length. No thrills or bruits were detectable. The bradycardic reaction was negative. The oscillometric reading for the right palm was 3/8 unit and left palm 1/8 unit. The blood pressure was 123/71 (mm. Hg.). Skin temperature was elevated 3.6 degrees (F.) in the right palm as compared with the left. Venous oxygen saturation determinations showed decided disparity, with the right increased over the left (control). Roentgenograms revealed a normal cardiac silhouette. An arteriogram of the right hand revealed a small mass of tortuous vessels in the center of the palm; the veins proximal to the mass were well outlined. Digital arteries distal to the mass were not well filled. The diagnosis was congenital arteriovenous fistulas of the palmar vessels of the right hand.

Fig. 2 (case 4).—Congenital arteriovenous fistulas with nevus flammeus, distended veins and hemihypertrophy of the arm.

CASE 4.—A white man, a laborer aged 24, seen in March 1949, had "always" had a nevus flammeus over the right arm and shoulder. The right arm had always been longer than the left (fig. 2), but there had been no disability in activity until August 1947, when pain occurred in the right upper arm while he was throwing a ball. Heat was applied, with subsidence of symptoms. In February 1948, constant aching in the forearm recurred and the patient was referred to us for study. Physical examination revealed that the right arm was 3.2 cm. longer and as much as 3 cm. greater in circumference than the left. Scattered areas of nevus flammeus were present over the right anterior shoulder, the forearm and wrist. Veins on the right were engorged; on simultaneous elevation of the arms they did not collapse until a higher level was reached. A thrill was present on the medial aspect of the right upper arm associated with a bruit showing both systolic and diastolic components. The bradycardic reaction was positive, with a decrease in pulse rate of 20 beats. Blood pressure was 112/76 (mm. Hg.). Venous pressure readings in the antecubital fossae were 166 (mm. Hg.) on the right and 92 on the left. Skin temperatures were elevated on the right as compared with the left. The venous oxygen saturation for the right arm was 91 per cent and the left arm (control) 37 per cent. Roentgenographically the cardiac silhouette was normal. Comparative studies of the bones of the arms revealed a lengthening on the right. Two arteriograms were made. The first (fig. 3) showed the distal portion of the right axillary artery to be normal; the brachial artery was greatly dilated, chiefly in the proximal portion, with decided irregularity in the caliber of the lumen. Numerous small vessels were visualized in the region of the elbow. The cephalic and brachial veins were filled with a contrast medium. A second arteriogram demonstrated innumerable tortuous ves-

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sels of varying caliber distal to the elbow and proximal to the wrist. Phlebograms showed distended veins. The electrocardiogram was normal. The diagnosis was congenital arterial aneurysm with arteriovenous fistulas involving vessels of the right forearm and upper arm.

CASE 5.—A Negro, a laborer aged 33, was seen in 1948 with a persistent pain in the right shoulder and arm that had been present for two years and was so severe that he discontinued working. During this time the veins in the affected area had become greatly enlarged. No vascular birthmarks had been noted, and there was no history of trauma. Physical examination revealed both arms to be symmetrical and normal in size. The veins of the right arm were decidedly distended and tortuous, one vessel measuring 3 cm. in diameter. No visible pulsations were noted. A thrill and a bruit with systolic and diastolic components were heard in the region of the shoulder. Venous pressures were decidedly elevated; the bradycardic reaction was positive. Skin temperatures were elevated 3.6-5.4 degrees (F.) on the right side. The venous oxygen saturation for the right arm was 77 per cent and the left arm (control) 22 per cent. Roentgenograms revealed a normal cardiac silhouette. Arteriograms were not obtainable. The diagnosis was congenital arteriovenous fistulas of the right arm.

CASE 6.—A white woman, a housewife aged 27, was first seen in January 1948. Vascular masses on the sole of the left foot, the leg and buttock had been present since birth. From early childhood it had been observed that the left lower extremity was longer than the right but that the right foot was smaller than the left. At the age of 14, a fall resulted in a persistent throbbing in the left buttock. Because of the gradual development of varicose veins in the left lower extremity, an operation was performed for the excision of vascular masses from the affected region. There was no improvement, and similar lesions slowly developed. In 1943 during her first pregnancy, there was an increase in the size of the vascular masses, and discomfort in the left buttock and labium occurred. When the patient again became pregnant, further enlargement of involved areas resulted. After the second delivery, pain in the left labium and buttock became severe, causing dyspareunia. Sclerosing therapy in the left leg was not helpful. In June 1947, labial masses were removed surgically, but this procedure increased dyspareunia. In July 1947, a left saphenous ligation and excision of dilated venous channels on the left knee were performed. In the following year there was no improvement, and the patient was referred for study. Physical examination revealed that the left lower extremity was 1.4

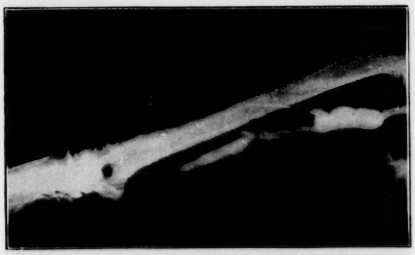

Fig. 3 (case 4).—Congenital arteriovenous fistulas with arteriogram showing aneurysmal deformity of brachial artery. There is some pooling of contrast medium in the region of the elbow (site of multiple fistulas). The cephalic vein is faintly visualized in this region and is distinctly dilated.

cm. longer than the right. The left foot was smaller than the right. A slight pelvic tilt to the right was observed. A nevus flammeus was present in the sacral region; vascular, nonpulsating masses from 1 to 3 cm. in size occurred in the left lower extremity. The skin on the left foot appeared atrophic. Hypertrichosis, most pronounced below the left knee, was present on the involved side. No thrills, bruits or abnormal vascular pulsations were demonstrable. Pelvic examination revealed only the presence of scar tissue on the left labium from previous surgical procedure. Skin temperature readings are shown in table 3.

Venous oxygen saturation for three segmental specimens were in the left foot 90.3 per cent; left leg 68.9 per cent; left buttock 42.0 per cent; right foot (control) 75.6 per cent.

TABLE 3.—*Skin Temperature (Fahrenheit) Readings in Case 6*

Region of Lower Extremity	Right Side	Left Side
First toe	81.3	88.3
Third toe	80.2	92.8
Foot, plantar surface	83.1	90.0
Knee, lateral aspect	88.9	91.4

TABLE 4.—*Skin Temperature (Fahrenheit) Readings in Case 7*

Region of Lower Extremity	Right Side	Left Side
Third toe	84.2	91.8
Fifth toe	84.6	90.0
Plantar surface, foot	87.4	91.0

(Abnormal vasoconstriction on the right necessitated the application of heat prior to venipuncture, which resulted in an increase in the venous oxygen.) Roentgenograms revealed a normal cardiac silhouette. The bones of the left foot were smaller than the right; no evidence of bone erosion was present. A few small phleboliths were noted in the soft tissue of the leg and in greater numbers in the pelvic and gluteal regions. Arteriograms were inconclusive. The phlebograms revealed dilated and irregular vessels in the foot and leg; the femoral vein was normal. The electrocardiogram was normal. The diagnosis was congenital arteriovenous fistulas of the right foot.

CASE 7.—A white man, an office worker aged 46, was seen in November 1949, with recurrent ulcerations of the left leg. A nevus flammeus of the left lower extremity had been present since birth; in early childhood it had been observed that the left leg was longer than the right. At the age of 18, dilated, tortuous veins were noted; subsequently saphenous and spot ligations and more than 50 sclerosing injections were given during a 10-year period with no decided improvement. After the age of 24 repeated small ulcerations occurred on the left foot and ankle; because of these and because of local pain the patient was referred for evaluation. Physical examination revealed an extensive nevus flammeus chiefly over the left lower extremity associated with dilated and tortuous superficial veins and sinusoids. The left lower extremity was 2.5 cm. longer and as much as 2.5 cm. greater in circumference than the right. There was a decided pelvic tilt to the right; abnormal vascular pulsations, thrills or bruits were not detectable. Skin temperature readings are given in table 4. Venous oxygen saturation for three segmental specimens were in left foot 68.3 per cent; left heel 59.4 per cent; left leg 46.5 per cent; right foot (control) 58.5 per cent. Roentgenograms revealed a normal cardiac silhouette. Arteriograms were inconclusive. The phlebograms revealed only numerous dilated venous channels with considerable variations in the size of the lumens. The electrocardiogram was normal. The diagnosis was congenital vascular anomaly, predominantly venous and capillary in type. It is possible that surgical procedures had obliterated multiple arteriovenous fistulas. A diagnosis could not be established from the available laboratory data, but clinically the patient closely paralleled case 6.

CASE 8.—A white soldier aged 19 was admitted February 1947, with dilated vascular masses of the right arm first observed 10 months previously (fig. 4). A sensation of heaviness, tenseness and fatigue occurred during the performance of his clerical duties. No undue muscular effort or trauma was recalled. Physical examination of the right arm in a dependent position revealed numerous superficial, thin-walled vascular structures, giving the hand and forearm a deep blue cast. A few dilated vessels were present in the upper arm and axilla. Veins of both arms were equally compressible on palpation. Peripheral arterial pulsations were equal and nor-

mal. On simultaneous elevation of the arms, the veins collapsed at the same level. There was no abnormal variation in sweating or in skin temperatures. The bradycardic reaction was negative. The left (unaffected) arm was 2.7 cm. longer than the right. Venous oxygen saturation for the right arm was 33 per cent and the left arm (control) 35 per cent.

Fig. 4 (case 8).—Congenital venous anomaly (phlebectasia) with large sinusoids and bizarre venous pattern.

An arteriogram revealed a normal arterial pattern in the right upper extremity. The phlebogram demonstrated numerous large saccular dilatations of venous tissue in the hand and forearm; phleboliths were present in the forearm. The diagnosis was congenital venous anomaly (phlebectasia).

CASE 9.—A white soldier aged 20 was admitted April 1947, with several soft, spongy, compressible vascular masses on the dorsum of the left foot that had first been noticed at the age of 13. When the patient entered the army, a rapid increase in size of the lesions occurred because of the stress of prolonged exercise. Dull aching pain and a sensation of fulness in the foot were present with physical exertion. Sclerosing therapy had been attempted with no reduction in the size of the lesions. There was no history of trauma. Physical examination revealed a group of thin-walled vessels of spongy consistency and bluish tint on the dorsum of the left foot and the left first, second and third toes. The veins collapsed at the same level on simultaneous elevation of the extremities. No pulsations of the vessels were noted; there were no thrills or bruits. Peripheral arterial pulsations were normal and equal. The temperatures of the two extremities were equal. Venous oxygen saturation for the dorsum of the left foot only was reported at 42 per cent. Roentgenograms of the foot revealed no abnormality of the bones or phleboliths. The phlebogram (fig. 5) demonstrated several saccular venous sinuses and dilated veins of variable caliber on the dorsum of the left foot. The diagnosis was congenital venous anomaly (phlebectasia).

CASE 10.—A white girl aged 15 noticed a swelling in the right palm after a minor injury four years previously. Its size was increasing slowly and was associated with occasional pain on hand movement. There was no history of a birthmark. Physical examination revealed a small mass (1.5 by 1.5 cm.) between the distal ends of the second and third metacarpal bones of the right hand. No pulsations, thrills or bruits were detected. The mass became tense when a tourniquet was applied to the forearm and decreased when the hand was elevated. Venous oxygen saturation determinations showed no discrepancy between the two sides. The phlebogram demonstrated a group of distended venous channels between the second and third metacarpals of the right hand with variation in the caliber of their lumens. The diagnosis was congenital venous anomaly (phlebectasia).

COMMENT

The clinical features of vascular anomalies would seem to depend on the stage of embryologic development, whether capillary, retiform or tubular, at which maturation ceases. It must also be emphasized that maturation appears to be halted at various stages in some involved areas, so that these patterns or combinations of them may coexist. A strict comparison of the anatomy of the primitive vascular network with the adult anatomic pattern is, however, impossible.

In an attempt to establish a classification, we think it most logical to consider the functional characteristics of the definitive picture as evidenced by clinical and laboratory observations, which establish, if possible, the physiological activity of the involved vessels. The following groupings with their examples tend to evolve: (1) anomalies of large vessels conducting blood to the part (arterial aneurysm); (2) anomalies of large vessels conducting blood away from the part (phlebectasia); (3) anomalies of minute vessels (nevus flammeus); (4) abnormal communications between arteries and veins (arteriovenous fistula), and (5) anomalies associated with combinations of these functional elements. This group is extremely complex, and the final clinical picture most frequently results from the presence of arteriovenous, venous and capillary elements (case 6).

Of six patients with arteriovenous fistulas, five had pain and discomfort in the region of the fistula; two were completely disabled from heavy work; one patient complained only of the unsightliness of the mass. Three

Fig. 5 (case 9).—Congenital venous anomaly (phlebectasia). Phlebogram shows dilated venous sinusoids, irregular caliber of venous lumen and collections of radiopaque clusters.

patients (cases 1, 2 and 3) had prominent, well defined lesions showing no regional hypertrophy; three patients (cases 4, 5 and 6) had associated limb enlargement. Superficial hamartomas of the telangiectatic type were present in four of the six patients; distended veins were

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observed in all. Thrills and bruits were demonstrable in three patients. Skin temperatures in the involved areas were elevated in all patients; venous oxygen determinations showed the pathognomonic elevation present in arteriovenous fistulas. Arteriograms were a diagnostic aid in four patients.

No demonstrable systemic effects could be detected other than in two paients with arteriovenous fistulas who had clinical evidence of increased blood volume. Among these six patients there were no symptoms of myocardial embarrassment; the cardiac silhouette was normal, as were electrocardiographic studies of the heart.

Case 7 presented a diagnostic problem; the clinical picture was comparable to that produced by arteriovenous fistulas, but confirmatory laboratory evidence of this diagnosis was lacking. Pain and disability were associated with hemihypertrophy, superficial vascular hamartomas, distended veins and recurrent ulceration. There was no evidence of systemic embarrassment. The possibility was apparent that the fistulas had been obliterated by surgical intervention; on the other hand, such symptoms could have resulted from a complex capillary and venous anomaly with hemihypertrophy produced by passive hyperemia.

Three patients with venous anomalies or phlebectasis (cases 8, 9 and 10) complained of aching and fulness in the affected extremity; venous enlargements were first observed at the ages of 11, 13 and 18 years. Minor trauma had occurred in one. No history was elicited of a known preceding vascular malformation. Two persons had lesions confined to only part of an extremity; in one, venous sinusoids involved the entire arm. No abnormal pulsations, thrills or bruits were detectable; venous pressures were normal, as were the venous oxygen saturation determinations. Phlebograms revealed the presence of dilated venous sinusoids in these patients.

With reference to therapy, since clinical variations between the various types of congenital vascular anomalies may be minor, an appraisal by available diagnostic methods is important. This cannot be entirely precise since one malformation may present all types of vascular channels. Nevertheless it is helpful to establish the physiological effects produced by the malformation and to determine the functional activity of the involved vessels. A knowledge of the precise localization of the anomaly, the vascular patterns and the caliber of their channels is useful in the selection of treatment. From these observations, although surgical intervention and radiotherapy may be of value in some patients, unnecessary or useless procedures can be avoided.

SUMMARY

The nomenclature, pathogenesis and clinical descriptions of unusual congenital vascular anomalies of the extremities are reviewed. Methods of diagnosis, including arteriography, venography and venous oxygen saturation determinations are discussed. Ten cases of congenital arteriovenous and venous malformations are reported.

ABSTRACT OF DISCUSSION

DR. HARRY L. ARNOLD, Honolulu, T. H.: I have seen few cases of this sort; in only a few instances of arteriovenous fistula was I asked to consult with the surgeons in our group. Nevertheless, I was greatly impressed by the authors' presentation. Their paper can be divided into two parts, the nosology of these diseases and the diagnostic and therapeutic approach to them. I sympathize with their difficulties in the classification, which is extraordinarily complex. These vascular lesions could be divided, in the first place, into the functional and the structural ones, and I think many of us have regarded those as two entirely separate groups. A significant feature of this paper is the authors' demonstration that the nonfunctioning and functioning angiodysplasias not infrequently occur together and one may provide a clue to the existence of the other. By that I mean that the hemangioma, the port-wine marks, which one might call nonfunctioning or structural dysplasias, may occur with those which are actually carrying blood, participating actively although in a disorderly way in the circulation of the blood. The functional ones could also be divided into the acquired and the traumatic. Some of these arteriovenous communications are the result of trauma. Those are excluded by the scope of the authors' paper but would have to play a part in any classification. As to the diagnostic and therapeutic side, they have provided extremely useful information. In some of our own cases, we have had great difficulty in deciding there really was an arteriovenous communication and, if so, where it was. Sometimes even surgical exploration will fail to show any such communication, and I think that the diagnostic measures that the authors have outlined are likely to be extremely useful. In the first place, the presence of these static vascular lesions may be helpful; the determination of venous oxygen tension is useful in both a positive and negative way. Abnormal tension indicates the transmission of arterial blood directly into the venous stream with elevation of the oxygen tension in the vein, and normal tension means that no such communication occurs. Not every test is useful under both circumstances. Many tests can be relied on only when results are positive. The temperature changes in the skin, of course, are of some value, although I think the authors showed that that might be misleading. It is a test which is not particularly valuable unless the results are positive. The beautiful demonstrations of arteriograms and venograms are most impressive and stimulating and certainly warrant a trial in the cases of these disorders.

DR. HYMAN I. GOLDSTEIN, Camden, N. J.: Of interest in connection with this study of congenital vascular lesions and unusual vascular lesions are my publications "Hereditary Hemorrhagic Telangiectasia with Recurring (Familial) Hereditary Epistaxis" (*Arch. Int. Med.* **27**:102 [Jan.] 1921) "Goldstein's Heredofamilial Angiomatosis with Recurring Familial Hemorrhages (Rendu-Osler-Weber's Disease)" (*Arch. Int. Med.* **48**:836 [Nov.] 1931) and "Hereditary Multiple Telangiectasia" (*Arch. Dermat. & Syph.* **26**:282 [Aug.] 1932).

This presentation is important from a diagnostic standpoint for the clinician as well as dermatologist. A patient may have hemoptysis, gastric bleedings, a cerebral accident (not hypertensive or arteriosclerotic) or other presenting symptom of hemorrhage elsewhere (not due to blood dyscrasia, hypertention or cardiovascular disease), such as severe epistaxis, rectal bleeding or tracheobronchial bleeding. Phlebectasia does occur; I have encountered 17 or 18 families during the past 35 years with this syndrome (Rendu-Osler-Weber's disease). In one family (1917-1921) I found 11 cases. Weber, Steiner, Hanes, Bean, Osler and many others have studied the subject of telangiectasia, phlebectasia, vascular nevi and angiomas. I recall several such cases with such lesions in the stomach, which were gastroscopically observed. The authors' presentation is most interesting.

CAPTAIN ACORS W. THOMPSON, Arlington, Va.: There is nothing particularly new in this presentation, but I would like again only to emphasize that an endeavor has been made to simplify the nomenclature of a complex and confused group of diseases, solely for practical purposes.

EVALUATION OF PANCREATIC FUNCTION TESTS

C. Wilmer Wirts, M.D.
and
William J. Snape, M.D., Philadelphia

The diagnosis of diseases of the pancreas is difficult because the organ is obscurely located; is rarely viewed by roentgen rays; its secretions are difficult to obtain, and frequently the symptoms are so similar to those associated with other diseases that differentiation is impossible. Both history and physical examination are important in diagnosis, but they rarely permit one to draw definite conclusions even though a pancreatic lesion is suspected. The determination of blood sugar levels, the trypsin content and the amount of fat and protein digestion in the stool, the serum amylase level and the secretin test are additional diagnostic aids. An increase in the blood sugar level and a decrease in fat and protein digestion in the stool are usually found only in long-standing and far advanced diseases of the pancreas and are therefore of limited value. The search for more specific pancreatic function tests led investigators to study by a variety of technics the enzymes elaborated by the pancreas in the blood, urine, feces and duodenal contents.

When considering the limitations of these tests it is well to recall the large functional reserve of the pancreas; a minimal amount of healthy tissue can produce a normal pancreatic juice and therefore an abnormality may not be demonstrated with any of the existing tests. In essence, the diseases of the pancreas for which one is testing, are either inflammatory or neoplastic, and the functional change produced is either pancreatic insufficiency or an obstructive phenomenon. Insufficiency is usually the result of an advanced diffuse lesion; the obstructive mechanism may result from an acute inflammatory process with minimal fibrotic change or a neoplasm localized in the head of the pancreas. Therefore, patients with mild inflammatory disease who are not tested shortly after an attack and those who have only moderate chronic change may show normal response. In advanced pancreatic insufficiency both the duodenal and the serum enzymes will be diminished; in the obstructive processes duodenal enzymes are diminished, but serum enzymes are elevated.

From the Gastrointestinal Clinic and the Departments of Medicine and Physiology of the Jefferson Medical College and Hospital.

Read before the Sections on Gastro-Enterology and Proctology and on Pathology and Physiology at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 30, 1950.

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STOOL TRYPSIN

A simple method for evaluating pancreatic function by testing for trypsin in the stool, originally described by Kniaskof in 1911, has recently been reemphasized. The method as modified by Harrison [1] consists in making a suspension of feces in a 1 per cent crystalline sodium carbonate solution and placing a drop on the film side of the strip cut from an x-ray or photographic plate and incubating for 30 minutes at 37 C. If trypsin is present, the gelatin is digested to water-soluble products, with the result that a clean punched-out hole is made in the film; if trypsin is absent, no change appears. This method appears to have been helpful in evaluation of the pancreatic function in children with cystic fibrosis of the pancreas.[2] A more refined technic has been reported by Burdon and Mudd.[3] Our own experience with it in adults is still limited, but we are currently investigating it.

SERUM AND URINE ENZYMES

One of the most significant tests for acute pancreatitis is that for serum amylase and lipase. In 1908 Schlesinger [4] observed a rise in the blood amylase in rabbits after the pancreatic duct was tied off. At about the same time Wohlgemuth [5] discovered an increase of amylase in the urine in acute pancreatitis. The rise in serum and urine amylase in acute inflammation of the pancreas and salivary glands is thought to be due to the swollen tissue obstructing the duct system sufficiently to increase the rate of ferment reabsorption. In advanced renal disease retention may cause an elevation of amylase in the blood. The diagnostic value of the determination of amylase in the serum in acute pancreatitis was demonstrated by Elman [6] and his associates in 1942 and has been amply confirmed by subsequent workers. Today, with rare exception, an elevated serum amylase is considered conclusive evidence of pancreatic edema or inflammation. Since good surgical judgment is opposed to immediate intervention in most cases of acute pancreatitis the estimation of the serum amylase has become a decisive and important diagnostic procedure. In practice, the determination of urinary amylase is less reliable than that of serum amylase.

Usually in patients with chronic recurrent pancreatitis the serum amylase levels are significantly elevated only during an exacerbation, but in some patients they may remain high during remissions. Extremely low levels may be seen in far advanced pancreatic disease. In some series an elevated serum amylase occurs in about a third of the patients with carcinoma of the head of the pancreas and in the majority of those with ampullary cancer.

SECRETIN TEST

Testing the external secretion of the pancreas by studying duodenal aspirations developed slowly because of the lack of a standard stimulus to the pancreas and the inaccessibility of its secretions. In 1902 Bayliss and Starling [7] showed the flow of pancreatic juice to be stimulated by a hormone, secretin, that is produced by the action of acid and chyme on the duodenal mucosa. The use of this hormone for the study of external pancreatic secretion was initiated by Chiray and his co-

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workers [8] in France. In 1934, Voegtlin, Greengard and Ivy [9] conducted an extensive investigation of both the human and the canine response to secretin, using a duodenal extract prepared in their laboratory. The early studies were hampered by the impurities of the secretin extracts and the difficulty in obtaining uncontaminated duodenal juice quantitatively. These obstacles were subsequently overcome by Hammarsten,[10] who produced a nontoxic secretin, and Agren and Lagerlof,[11] who devised a means of draining the duodenum with a double-lumened gastroduodenal tube under constant suction (fig. 1). The studies of these workers were confirmed by Diamond and Siegal [12] and others,[13] who established the characteristics of the normal secretin response and its clinical significance. The procedure is now called the secretin test and is performed in our clinic at Jefferson Medical College Hospital in the following manner:

The gastroduodenal tube is passed and its exact location verified by fluoroscopy. Separate gastric and duodenal samples are collected by continuous aspiration at a negative pressure of 30 to 50 mm. of mercury. After the collection of a basal sample during a 20 minute control period secretin is administered intravenously in a dosage of 1.1 clinical units per kilogram of body weight. We use secretin prepared by Dr. Friedman in the department of physiology or that made by Wyeth, Inc., according to the procedure of Friedman and Thomas.[14] Continuous collection of gastric and duodenal contents is carried out for a period of 60 minutes, the samples being divided into the fractions obtained at 10, 20, 40 and 60 minutes.

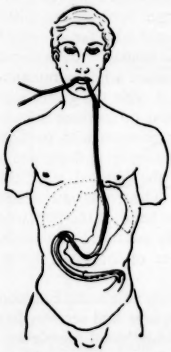

Fig. 1.—Double-lumened gastroduodenal tube in position for performing the secretin test, with one tip at the splenic flexure and one tip at the pylorus.

The control of external pancreatic secretion, in essence, is based on three mechanisms: (1) the secretin mechanism, which provokes a watery pancreatic juice of great volume, rich in bicarbonate and low in enzymes; (2) the pancreozymin [15] mechanism which causes an outpouring of the pancreatic enzymes, and (3) the nervous mechanism, the vagus nerves and probably some cholinergic sympathetic nerves. The role of the vagal mechanism has been suggested by Thomas and associates [16] to be that of a "tonus mechanism which may augment or inhibit the local reflexes."

In normal subjects the total volume and bicarbonate concentration of the pancreatic secretion rise in proportion to the amount of secretin given. The enzyme (trypsin, amylase, lipase) concentration, however, falls after secretin is given because of the washing-out process, and it is increased only after vagal stimulation or the administration of pancreozymin. Friedman and Snape [17] demonstrated the effect of vagal stimulation by administering intravenously 0.1 unit of crystalline insulin per kilogram of body weight combined with secretin. Compared with the effects of secretin alone, the addition of insulin did not influence the volume response but did increase the output of enzymes by about 60 per cent.

While there is uniformity of opinion as to the results of the secretin test in normal subjects, the findings in disease of the pancreas are variable in the hands of different investigators. When employing this test Diamond and Siegal [12] found that in patients with severe lesions all pancreatic functions were simultaneously diminished. In what they construed as milder forms of pancreatic disease the enzyme production was the first to be impaired while the volume and bicarbonate content remained unchanged. Friedman and Snape [18] confirmed these findings and observed that the use of additional agents such as methacholine (mecholyl®) chloride, insulin or pancreozymin to increase the output of enzymes probably added little of diagnostic value. Comfort and his associates [19] felt that the determination of total volume, concentration of bicarbonate and total bicarbonate are the important parts of the secretin test. In patients with chronic pancreatitis they found these values depressed, in patients with sprue the values were normal. Dreiling and Hollander [13b] performed the test in 145 patients. In 11 with chronic relapsing pancreatitis they found the depression of bicarbonate content pronounced but the volume and amylase content less so; in 16 patients with carcinoma of the pancreas there was considerable reduction in volume but much less in the concentration factors. In summary, the normal response to the secretin test shows an increase in volume and a fall in the enzyme content. In mild pancreatitis there is a depression of the enzymes and little change in the volume, while in the advanced disease there is a depression of both volume and enzymes. The test is not specific and therefore will not indicate whether there is neoplastic change or only inflammatory change in the pancreas, but it will indicate moderate or severe impairment of acinar cell function.

In spite of these results, the secretin test has definite practical limitations. The gastroduodenal tube is large and uncomfortable for the patient; fluoroscopic control is necessary for proper placing of the tube, and,

8. Chiray, M.; Salmon, A. R., and Mercier, J.: Action de la sécrétine purifiée sur la sécrétion externe du pancréas de l'homme, Bull. et mém. Soc. méd. d. hôp. de Paris **50**: 1417, 1926.

9. Voegtlin, W. L.; Greengard, H., and Ivy, A. C.: The Response of the Canine and Human Pancreas to Secretin, Am. J. Physiol. **110**: 198, 1934.

10. Hammarsten, E., and others: Studies in the Purification of Secretin, Biochem. Ztschr. **264**: 275, 1933.

11. Agren, G., and Lagerlof, H.: The Pancreatic Secretion in Man after the Administration of Secretin, Acta med. Scandinav. **90**: 1, 1936.

12. Diamond, J. S., and Siegal, S. A.: The Secretin Test in the Diagnosis of Pancreatic Disease with a Report of 130 Tests, Am. J. Digest. Dis. **7**: 435, 1940.

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14. Friedman, M. H. F., and Thomas, J. E.: The Preparation of Secretin, Proc. Soc. Exper. Biol. & Med. **73**: 345, 1950.

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16. Thomas, J. E., and Kamarov, S. A.: Physiological Aspects of Vagotomy, Gastroenterology **11**: 413, 1948.

17. Friedman, M. H. F., and Snape, W. J.: Influence of Secretin and Insulin on Pancreatic Secretion in Healthy Human Subjects, Proc. Soc. Exper. Biol. & Med. **70**: 280, 1949.

18. Friedman, M. H. F., and Snape, W. J.: Dissociation of Secretion of Pancreatic Enzymes and Bicarbonate in Patients with Chronic Pancreatitis, Gastroenterology, to be published.

19. Comfort, M. W., and others: External Pancreatic Secretion as Measured by the Secretin Test in Patients with Idiopathic Steatorrhea (Nontropical Sprue), Gastroenterology **13**: 135, 1949.

while it is designed to prevent gastric juice from entering the duodenum, this effect is not always successful in patients who are not sufficiently calm. The range of response among normals is wide, and mild disturbances in pancreatic function are not apparent. Recently it has been shown by Waldron, Thomas and Tkacz [20] that pancreatic function is increased by the mechanical effect of a tube in the duodenum. Also, the secretin stimulation causes a decrease rather than an increase in the concentration of enzymes in the duodenum and therefore does not reveal the concentration at which the pancreas is capable of secreting enzymes. One might summarize the shortcomings of the secretin test as being too time consuming, too strenuous for the debilitated patient and too expensive for the results obtained. Because of these drawbacks attention has been redirected to a study of the serum amylase and lipase.

SERUM ENZYMES FOLLOWING PANCREATIC STIMULATION

In 1943 Popper and his associates [21] studied in dogs the response of serum amylase and lipase to the administration of secretin and methacholine chloride with physostigmine sulfate. They suggested that these or related drugs in the proper dosage might be of value to humans, avoiding the need for duodenal intubation. Secretin alone does not cause a rise in serum enzymes in normal subjects, but it does if an obstructive mechanism is produced. To produce such an obstructive mechanism morphine sulfate, methacholine chloride or urecholine® (carbaminoyl-beta-methylcholine chloride) is given with secretin; recently we have learned that methacholine chloride or urecholine® may be used alone for this purpose.[21a] In patients who have an obstructive mechanism produced by disease of the pancreas a rise in the enzymes will follow the administration of secretin alone. These values are usually higher than those produced in normal subjects. On the other hand, patients with advanced pancreatic insufficiency fail to show a rise in the serum enzymes following any form of pancreatic stimulation because of the lack of acinar cell function. In 1945 Lagerlof [22] gave secretin intravenously to stimulate the pancreas and morphine to cause spasm of the sphincter of Oddi. He reported that this "often" caused an elevation of the serum amylase and produced pain and mild symptoms of pancreatitis. Myhre and his colleagues [23] found after large doses of secretin administered intravenously and methacholine chloride administered intramuscularly a significant rise in serum amylase and lipase as compared with control values in 70 per cent of cases. The same response followed morphine sulfate and secretin in normal subjects but failed to occur in nine patients they tested with far advanced pancreatic disease. Lopusniak and Bockus [24] determined the serum amylase and lipase values while simultaneously performing the secretin test with the gastroduodenal tube and found that there was no increase in concentration in normal subjects. In patients with pancreatitis who showed an elevated fasting level there was a further rise in concentration if the interval after the attack did not exceed 10 weeks. There was also a rise in two patients with cancer of the head of the pancreas who had normal fasting levels. In advanced pancreatic insufficiency and extensive cancer of the body of the pancreas there was no rise.

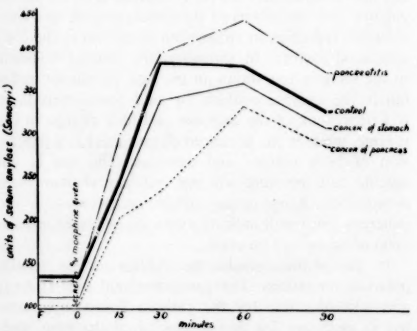

Fig. 2.—Average curves for serum amylase values after secretin (1 unit per kilogram of body weight intravenously) and morphine sulfate (10 to 15 mg. intramuscularly).

Our own experience in evaluating pancreatic function by means of an injection of morphine and secretin has been previously reported.[25] A fasting blood sample was taken to determine the basal serum amylase; 10 to 15 mg. of morphine sulfate was given subcutaneously, and 1 unit of secretin per kilogram was injected intravenously 30 minutes later. Blood samples were taken 15, 30, 60 and 90 minutes thereafter for serum amylase determination according to the Somogyi method. Forty-four subjects were studied in this manner, including 25 control patients, eight patients with cancer of the pancreas, six with pancreatitis and five with cancer of the stomach. In the 25 control patients the average basal value was 133.5 units; after an injection of secretin the peak value occurred at the end of the 30 or 60 minute interval, with an average of 389.3 units. In the patients with cancer of the pancreas prestimulation and poststimulation and peak values were significantly lower than in the control patients. In 62.5 per cent of these patients amylase values were below the lowest obtained in the control patients before stimulation, and after stimulation 50 to 75 per cent had values lower than the minimal control figure. In the other two pathological groups there was little difference from the control subjects, although it should be noted that the average values in pancreatitis were higher than the controls (fig. 2).

20. Waldron, J. M.; Thomas, J. E., and Tkacz, L. P.: Pancreatic Secretion in Response to Mechanical Stimulation of the Duodenum, Federation Proc. **8**: 161, 1949.

21. Popper, H. L., and Necheles, H.: A New Test for Pancreatic Function: Experimental Observations, Gastroenterology **1**: 490, 1943.

21a. Personal communication to the authors.

22. Lagerlof, H.: Normal Esterase and Pancreatic Lipase in the Blood: A Study with New Chemical and Clinical Methods (A Second Secretin Test), Acta med. Scandinav. **120**: 407, 1945.

23. Myhre, J.; Nesbitt, S., and Hurly, J. T.: Response of Serum Amylase and Lipase to Pancreatic Stimulation as a Test of Pancreatic Function: The Mecholyl-Secretin and the Morphine-Secretin Tests, Gastroenterology **13**: 127, 1949.

24. Lopusniak, M. S., and Bockus, H. L.: Study of Pancreatic Serum Enzymes Following Secretin Injection in Pancreatic Affections, Gastroenterology, to be published.

25. Snape, W. J.; Wirts, C. W., and Friedman, M. H. F.: Evaluation of Pancreatic Function by Means of Induced Hyper-Amylasemia Following Morphine and Secretin, Proc. Am. Federation Clin. Research in Am. J. Med. **6**: 23, 1949.

After this study, because of the lack of secretin, we sought another pancreatic stimulant. We found the rise in serum amylase in normal subjects after the administration of methacholine chloride (10 mg. subcutaneously), urecholine* (5 mg. subcutaneously), alone and with morphine sulfate (10 mg.), comparable to that obtained following secretin and morphine sulfate. We also compared a photometric method for the determination of amylase in the blood described by Smith and Roe [26] with that of Somogyi [27] and found the poststimulation curves comparable, but the Smith-Roe values consistently were of a lower order. This method eliminates the inherent difficulties of a visually selected end point and requires less work and time than the saccharogenic methods. In the following patients the serum amylase was determined photometrically before and 15, 30, 60 and 90 minutes after giving 5 mg. of urecholine* subcutaneously. Of the group of 34 patients, 19 were normal control subjects, six had carcinoma of the pancreas and 10 had chronic relapsing pancreatitis. The results are shown in figure 3.

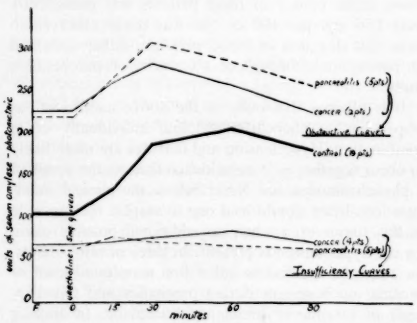

Fig. 3.—Average curves for serum amylase values after urecholine (5 mg. subcutaneously) in normal subjects and patients with pancreatic disease.

In four patients with carcinoma of the pancreas proved histologically after operation the average values were definitely lower than those of the controls, but two others who had inoperable cancer showed all values higher than the average control values. Therefore we find that two types of response are possible in cancer of the pancreas: high values, indicating an obstructive mechanism, and low values, indicating insufficiency. The diagnosis for the 10 patients with chronic pancreatitis was considered well established on clinical grounds; the five showing low values came to operation because of suspicion of cancer of the pancreas; in three cholecystojejunostomy was performed or T tube drainage was instituted to overcome the jaundice that appeared to be the result of a fibrotic pancreas. Two of the latter patients had diabetes mellitus. Those patients showing the higher values had symptoms of varying degree, but all responded to medical management. Again in pancreatitis, as in cancer of the pancreas, two types of response are possible, the high values showing the presence of an obstructive mechanism and the low values denoting insufficiency. Thus it appears that this test (serum enzyme levels following pancreatic stimulation), like the secretin test, is not specific, but it can indicate disease of the pancreas. In general, two types of abnormal response occur: values higher than the controls, which are associated with an obstructive process, and low values, associated with insufficiency of the pancreas. Since secretin alone fails to cause a rise in serum enzymes in normal persons and in persons with pancreatic insufficiency it appears preferable to combine it with morphine, methacholine chloride, or urecholine,* which will cause a substantial rise in the majority of normals but not in those with pancreatic insufficiency. Methacholine chloride and urecholine* alone appear to have a similar effect.

SUMMARY

We have reviewed the available methods of testing pancreatic function. The fasting serum amylase level is generally considered a satisfactory method of studying acute pancreatitis. In advanced disease the alteration in the character of the stool and glucose metabolism are diagnostic aids. The secretin test is a more accurate method of determining pancreatic function, but it has the serious drawbacks of being too cumbersome, time consuming and expensive. On the other hand, a study of the serum enzymes after pancreatic stimulation is a simplified procedure that merits further study.

There is suggestive evidence that urecholine* increases the level of blood amylase by simultaneously constricting the ampullary mechanism and stimulating enzyme production. Urecholine* given subcutaneously to a dog produces a rise in serum amylase similar to that found in the human. However, if the ampulla is made patent by a glass cannula, the serum amylase does not rise significantly in response to the injection. The juice collected from a cannula after urecholine* injection is of high specific gravity, indicating increased enzyme content.

26. Smith, B. W., and Roe, J. H.: A Photometric Method for the Determination of Amylase in Blood and Urine with Use of Starch Iodine Color, J. Biol. Chem. **179**: 53, 1949.

27. Somogyi, M.: Micromethods for Estimation of Diastase, J. Biol. Chem. **125**: 399, 1938.

Fractures in Children.—Fractures in children are physiologically unlike fractures in adults because the forces obeying Wolff's law are present, the rate of healing is much faster, and longitudinal and circumferential or appositional growth factors are present. These three physiological actions allow considerable leeway in the accurate replacement of the fragments, and normal function without deformity is the rule, provided these forces of nature are not interfered with by repeated manipulation or open operation. In fractures of the long bones, good alignment, or even fair alignment, and contact of the fragments are all that are usually necessary for an ultimate good result. In general, satisfactory apposition of the fragments, moderate overriding, and even angulation of less than 10 degrees are not too important. This does not mean that fractures in children should not be accurately reduced and adequately immobilized, if possible, as the return to normal function and convalescence is greatly hastened if this can be accomplished.

Operative interference must be resorted to in certain cases in which there is evidence of soft tissue interposition of nerve injury, circulatory injury which may result in Volkmann's ischemic contracture, and in certain cases in which satisfactory reduction was prevented by extrinsic factors beyond control or complicated by abdominal or head injuries.—Richard T. Odell, M.D., and Stanley M. Leydig, M.D., *Surgery, Gynecology and Obstetrics*, January 1951.

CURRENT METHODS OF DIAGNOSIS OF PHEOCHROMOCYTOMA

Evan Calkins, M.D., Boston
George W. Dana, M.D.
and
John Eager Howard, M.D., Baltimore

Since Pincoffs and Shipley first successfully diagnosed and removed a pheochromocytoma 20 years ago,[1] the search for this uncommon but usually curable cause of hypertension has received considerable attention. With the accumulation of a series of reported proved cases which now reaches over 100, a variety of clinical patterns has been recognized.

In our experience, reproducible symptomatic attacks associated with transient hypertension are still the outstanding manifestations of this disease and should always lead one to suspect its presence. Nine of the 12 patients whom we have seen at the Johns Hopkins Hospital and in neighboring institutions either complained primarily of such attacks or experienced them during observation in the ward. Although the manifestations and their severity varied considerably from patient to patient, the attacks followed the same pattern in each case. In all instances the paroxysmal hypertension was associated with anxiety, headache and precordial and epigastric distress. Most patients also experienced blanching, chiefly of the extremities, palpitation, shortness of breath, nausea or vomiting and a profuse sweat.

The differentiation of paroxysmal attacks due to pheochromocytoma and severe anxiety attacks in emotionally labile persons was often difficult. There were, however, several important differences. Most of the patients with pheochromocytoma were emotionally stable. Although the paroxysms were occasionally precipitated by anxiety or exertion, they were more frequently caused either by a mechanical factor such as pressure over the tumor or by a metabolic one such as hypoglycemia. In half of the cases they were preceded by a recognizable but indescribable aura. In all instances in which an attack was studied from its onset, the precordial pain followed, rather than preceded, the elevation of blood pressure.

There are many patients with pheochromocytoma in whom the hypertension is persistent rather than paroxysmal and who present a picture almost identical with that of essential vascular hypertension. The percentage of these was relatively low (25 per cent) in our series, in which the diagnosis was made clinically. Smithwick, however, reports that paroxysmal attacks were experienced by only four of his 11 patients, in most of whom the tumor was encountered unexpectedly during sympathectomy.[2]

Persons with persistent hypertension due to pheochromocytoma and those with paroxysmal hypertension when seen between attacks frequently manifest other pharmacological effects of epinephrine.[2] These manifestations, when present, are important clues to the presence of the tumor. Over half of our patients were observed to sweat profusely and almost continuously. Several had rapid pulse and low grade fever, occasionally accompanied with leukocytosis. Four had basal metabolic rates of greater than + 15, and three of these had been treated for hyperthyroidism at some time in the past, with little improvement in symptoms. Two of the patients had been treated for diabetes mellitus, which disappeared after surgical removal of the tumor.[3] It is interesting that although the fasting blood sugar in one of these patients was consistently over 156 mg. per 100 cc., he was never observed to have any elevation in blood pressure, either sustained or paroxysmal, throughout six weeks of preoperative study.[3b]

It is obvious that none of the above manifestations is peculiar to pheochromocytoma, individually or in combination. Hypertension and diabetes are more likely to occur together as a coincidence than as the result of a pheochromocytoma. Nevertheless, the clinical manifestations listed should lead one to suspect the presence of this tumor even when an additional possible cause for the hypertension is present. In three of our patients, for example, the disease either first manifested itself or became much severer during pregnancy and the diagnosis of toxemia of pregnancy was made. In another patient, a congenital hypoplastic kidney was present in addition to the chromaffin tumor.

In order to assist in identifying those persons whose hypertension or other symptoms are due to pheochromocytoma, various pharmacological tests have been introduced during the past five years. These are of two sorts. First are those designed to stimulate the discharge of pressor compounds from the tumor and thus to reproduce an attack for careful study. Second are those designed to lower the blood pressure by competitive inhibition of the pressor compounds secreted by a tumor.

HISTAMINE TEST

The most reliable agent in the first group is histamine. The histamine test has been performed in all the seven cases of pheochromocytoma which have been correctly diagnosed in the series since the introduction of the test in 1945 by Roth and Kvale.[4] The test has also been performed on many other patients. Rapid intravenous injection of between 0.05 and 0.0125 mg. of histamine base was invariably followed by a severe flush, headache and, in those patients in whom blood pressure determinations were made with sufficient rapidity, a sharp but fleeting fall in blood pressure. In five of the

From the Medical Clinic, the Johns Hopkins University and Hospital.
Read before the Section on Surgery, General and Abdominal at the Ninety-Ninth Annual Session of the American Medical Association, Atlantic City, June 28, 1950.

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2. Smithwick, R. H.; Greer, W. E. R.; Robertson, C. W., and Wilkins, R. W.: Medical Progress: Pheochromocytoma, New England J. Med. **242**: 252, 1950.
3. (*a*) Duncan, L. E., Jr.; Semans, J. H., and Howard, J. E.: Adrenal Medullary Tumor (Pheochromocytoma) and Diabetes Mellitus: Disappearance of Diabetes After Removal of the Tumor, Ann. Int. Med. **20**: 815, 1944. (*b*) To be published.
4. Roth, G. M., and Kvale, W. F.: A Tentative Test for Pheochromocytoma, Am. J. M. Sc. **210**: 653, 1945; Pharmacologic Tests as Aid in Diagnosis of Pheochromocytoma, Mod. Concepts Cardiovas. Dis. **18**: 41, 1949.

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six cases with subsequently proved pheochromocytoma, the patient then suddenly blanched and cried in alarm. The blood pressure rose precipitously, in one instance from 140/90 to 300/190 within one minute, and in all instances greatly in excess of the cold pressor response. The patient broke out in a profuse sweat and experienced all the manifestations of a severe spontaneous attack. Although no vascular catastrophes were experienced by any of our patients, the possibility of such an occurrence renders the test hazardous in persons who have elevated base-line blood pressure, weakened vascular systems or lowered cardiac reserve.

In several other patients histamine produced a violent headache, accompanied with a rise in systolic and diastolic blood pressure as great as that seen in some patients with proved pheochromocytoma and greater than the cold pressor response. Because the rise in pressure was not accompanied with pallor, dilatation of the pupils or conspicuous sweating, because the patients appeared to be neurotic or hypersensitive to pain and in many cases because of a negative benzodioxan test, these patients were thought to have essential vascular hypertension and exploration was not carried out in most of them. In one case, in which the administration of histamine was followed by a blood pressure increase of 100 mm. of mercury systolic and 50 mm. diastolic, extensive abdominal exploration was carried out and no tumor was found.[5]

In one patient with paroxysmal hypertension due to pheochromocytoma, the histamine test was negative. This patient was a 57 year old woman (M. J. E.) seen with the staff of the Hospital for the Women of Maryland.[6] Although her resting blood pressure was only 120/60, it rose to much higher levels with emotional stimuli. Several times daily it reached as high as 220/120, and the patient experienced a severe headache and anxiety. She was given no sedative or other drug prior to the performance of the tests. Intravenous administration of 0.025 mg. of histamine base was followed by a transitory fall in pressure from 120/60 to 90/40, accompanied with severe headache and alarm, but the pressure did not rise higher than 130/60. The cold pressor test also produced an elevation in systolic pressure of only 10 mm. Retrograde pyelography revealed a hypoplastic left kidney. Because the attacks were highly characteristic of pheochromocytoma, exploration was carried out through the anterior approach. After removal of the left kidney the blood pressure continued to fluctuate, and further examination revealed a pheochromocytoma in the right adrenal area. On removal of the tumor, the pressure fell to shock levels and intravenous epinephrine infusion was required over a 24 hour period. The patient experienced no recurrence of her paroxysms of hypertension or other symptoms. Analysis of the tumor was performed by Dr. Goldenberg at the Presbyterian Hospital in New York. It contained 0.17 mg. of epinephrine and 6.85 mg. of nor-epinephrine per gram of tissue. There seems little doubt that the paroxysmal hypertension was caused by the pheochromocytoma.

BENZODIOXAN TEST

The epinephrine competitor which has received the most widespread trial in the diagnosis of pheochromocytoma is benzodioxan (benodaine).[7] Goldenberg, Snyder and Aranow [8] have observed that intravenous administration of this drug over a two minute period in a dose of 10 mg. per square meter of body surface is followed by a significant fall in blood pressure in many patients with hypertension due to pheochromocytoma. Such a response was obtained in one patient (E. S.) in this series.[9]

In two other patients with proved pheochromocytoma, however, the hypertension was not significantly lessened by the use of benzodioxan. One of these (P. McC.)[10] was a 37 year old man with paroxysmal hypertension and a resting blood pressure ranging between 130/70 and 150/90. The benzodioxan test was performed on two occasions, at one time with a base-line blood pressure of 140/70 and on the second occasion with a base-line pressure of 170/90. On both occasions injection of 20 mg. of benzodioxan was followed by a slight rise in systolic blood pressure and no change in the diastolic level. After surgical removal of a pheochromocytoma from the right adrenal area, the blood pressure remained at 145/75 for three days and then fell to 125/60. Analysis of the tumor by Dr. Goldenberg revealed a content of 6.0 mg. of epinephrine and 4.72 mg. of nor-epinephrine per gram of tissue.

The second patient (E. G.)[11] was a 28 year old woman who had a markedly labile blood pressure, usually hovering about 190/90 but rising much higher on several occasions daily. Although with amobarbital (amytal®) sedation her pressure fell almost to normal levels, benzodioxan in a dose of 20 mg. (10 mg. per square meter of body surface) produced only a fleeting fall in diastolic pressure. After surgical removal of a pheochromocytoma from the left adrenal area, the blood pressure fell to unobtainable levels and a steady intravenous infusion of epinephrine was required for 24 hours postoperatively. The tumor was found to contain 0.41 mg. of epinephrine and 5.65 mg. of nor-epinephrine per gram of tissue.

In two patients with later proved pheochromocytomas in whom histamine had produced typical paroxysms, benzodioxan was administered between five and three minutes prior to the injection of histamine in an attempt to block the hypertensive response to the latter agent. This was effectively accomplished in one patient (P. McC.), in whom the histamine produced a severe flush and headache but minimal elevation in

5. This patient was seen with Drs. L. Serra, J. Urlock and S. P. Scalia at the South Baltimore General Hospital.

6. To be reported by C. Decker, F. MacDowell and I. R. Trimble.

7. The benzodioxan used in this study was provided in part by Merck & Co.

8. Goldenberg, M.; Snyder, C. H., and Aranow, H., Jr.: New Test for Hypertension Due to Circulating Epinephrine, J. A. M. A. **135**: 971 (Dec. 13) 1947.

9. Davis, F. W., Jr.; Hull, J. G., and Vardell, J. C., Jr.: Pheochromocytoma with Neurofibromatosis, Am. J. Med. **8**: 131, 1950.

10. The authors studied this patient in consultation with Dr. Robert E. Mason, who will report it in detail elsewhere.

11. This patient was seen in consultation with Dr. E. Cowles Andrus.

blood pressure and none of the symptoms characteristic of a spontaneous attack. In a second patient, however, the symptomatic and blood pressure response to histamine was not significantly altered by the previous administration of benzodioxan.[12]

ROENTGENOLOGIC TECHNICS

In addition to the above pharmacological tests for the presence of pheochromocytoma, there are certain roentgenologic technics which are of value in localizing the tumor. Although perirenal air injection has been reported to be effective, in our hands the interpretation has been confusing, and in one instance alarming, though not fatal, air embolism ensued. More recently laminograms have been used in three patients with pheochromocytoma and have correctly localized the tumor in all. Obviously, however, this technic would not be expected to disclose tumors of very small size or in bizarre location.

COMMENT

The pharmacological tests mentioned are obviously of great value in helping to confirm the clinical suspicion of pheochromocytoma. The histamine test is particularly suited to persons with normal or slightly elevated base-line blood pressures and has been, in our hands, the most reliable single test for functioning adrenal medullary tumor. It is of great value also when used postoperatively. The reaction to it has remained negative in those patients who are symptom free and thus appear to be cured. In some cases, however, the tumor may be multiple or recurrent or metastases may be present. In one such patient who had three recurrences, finally dying with widespread metastases, the histamine correctly indicated the presence of additional chromaffin cells on each occasion.[13]

Because of the effectiveness of histamine in stimulating paroxysms in the first five patients with pheochromocytoma in whom it was used we have not deemed it necessary or advisable to try other stimulants of chromaffin tissue. It was most disturbing, however, to encounter the patient (M. J. E.) with pheochromocytoma whose blood pressure failed to rise in response to histamine but who had repeated blood pressure elevations in response to emotional stimuli. The high proportion of nor-epinephrine in the tumor does not offer a likely explanation for the failure of the histamine test since Dr. Goldenberg reports a similar ratio of nor-epinephrine and epinephrine in the tumor of a patient in whom the histamine test was positive.[14] Other patients with pheochromocytoma in whom the reaction to the test was negative have recently been observed elsewhere.[15]

Interpretation of the histamine test is also made particularly difficult by the pronounced elevations in blood pressure, sometimes greater than the cold pressor response, which are occasionally seen in persons who have few of the other manifestations of pheochromocytoma. Often reassured by a negative benzodioxan reaction, we have considered that these patients did not have pheochromocytoma and subjected only one to exploration. In retrospect, however, it seems possible that some of them actually may have had this tumor.

The benzodioxan test has been particularly useful in the presence of sustained hypertension. It has correctly indicated the presence of pheochromocytoma in a total of 59 cases studied to date at various institutions.[16] Nevertheless, it failed to produce a significant fall in blood pressure in two patients with pheochromocytoma studied at this clinic. Although the first patient, P. McC., did not have a markedly elevated resting blood pressure, the test was performed on one occasion when the pressure had been stabilized at 170/90 for over one half hour, and no fall in pressure ensued. The second patient, E. G., was invariably hypertensive, and benzodioxan produced only a fleeting fall in diastolic pressure. Recent reports from other clinics also describe occasional patients with sustained hypertension due to pheochromocytoma in whom the benzodioxan test has been negative.[17]

Two possible explanations for these negative benzodioxan reactions suggest themselves. In some hypertensive patients in whom benzodioxan produced negligible fall in blood pressure, the pressure is little changed immediately after surgical removal of the tumor and falls to normal gradually during the following few weeks. In these patients the pheochromocytoma may have caused hypertension through some mechanism other than the direct effect of epinephrine or nor-epinephrine on the cardiovascular system.[18] In other patients, such as E. G., even with a negative benzodioxan reaction, the secretions of the tumor appear to have been directly responsible for the maintenance of blood pressure, since the pressure fell to unobtainable levels on ligation of the tumor pedicle and intravenous administration of epinephrine was required. Furthermore, as previously noted, benzodioxan will not in all instances inhibit the hypertension due to an artificially induced discharge of pressor substance from a tumor. It appears, therefore, that benzodioxan in doses which can safely be used may not compete successfully with the concentration of pressor substance which is continuously secreted by some tumors.

Dibenamine® (N,N-dibenzyl-beta-chloroethylamine) is a competitor which has a much greater affinity for the epinephrine receptor and a more prolonged effect. This drug has been used on several patients with pheo-

12. This patient was seen at the Georgetown University Hospital, Washington, D. C., through the courtesy of Dr. Laurence Kyle.

13. Calkins, E., and Howard, J. E.: Bilateral Familial Pheochromocytoma with Paroxysmal Hypertension: Successful Surgical Removal of Tumors in 2 Cases; With Discussion of Certain Diagnostic Procedures and Physiological Considerations, J. Clin. Endocrinol. **7**: 475, 1947.

14. Goldenberg, M.: Personal communication to the authors. Gross, G. O., and Pace, J. W.: Malignant Pheochromocytoma with Paroxysmal Hypertension and Metastasis to Cervical Spine, J. A. M. A. **142**: 1068 (April 8) 1950.

15. (*a*) Bartels, E. C., and Cattell, R. B.: Pheochromocytoma: Its Diagnosis and Treatment, Ann. Surg. **131**: 903, 1950. (*b*) Aranow, H., Jr.: The Differential Diagnosis of Pheochromocytoma, in Symposium on Cardiovascular Diseases, M. Clin. North America **34**: 757, 1950.

16. Goldenberg, M., and Aranow, H., Jr.: The Diagnosis of Pheochromocytoma by the Adrenergic Blocking Action of Benzodioxan, J. A. M. A. **143**: 1139 (July 29) 1950.

17. Wilkins, R. W., and Goldenberg, M.: Personal communications to the authors.

18. Calkins, E.; Dana, G. W.; Seed, J. C., and Howard, J. E.: On Piperidylmethyl-Benzodioxane (933-F), Hypertension and Pheochromocytoma, J. Clin. Endocrinol. **10**:1, 1950. Goldenberg and Aranow.[16]

chromocytoma, including the patient M. J. E. described previously, and has inhibited paroxysms of hypertension and other symptoms for periods of approximately 72 hours.[19] Inasmuch as dibenamine® also reduces blood pressure in certain types of essential hypertension,[20] inhibition of hypertension by this drug cannot be interpreted as strong evidence in favor of pheochromocytoma. In some clinics dibenamine® is also used during operation for pheochromocytoma in order to reduce the severity of hypertensive episodes.[21] The use of such a long-acting drug does not seem advisable. One patient is reported from another clinic whose blood pressure fell to unobtainable levels after removal of a pheochromocytoma. Because of the previous administration of dibenamine,® intravenous administration of epinephrine had no effect on the blood pressure and the patient died.[22] Surgical removal of the pheochromocytoma was attempted in nine of the 12 cases mentioned in this report, and it was successfully accomplished in all without the use of epinephrine competitors.

Benzodioxan has not, in our experience, produced any positive responses in patients in whom no tumor was found. One of our patients (S. R.) with a positive benzodioxan test proved to have a neuroblastoma, and biologic assay disclosed negligible content of pressor compound.[23] She was therefore not included in the above series. After removal of the tumor, however, the patient was relieved of hypertension for six months, until it recurred with the development of metastases. In this instance the test can hardly be said to have led us astray.

It is apparent that pharmacological tests such as those mentioned here are devious at best. A much more direct and safe diagnostic aid would be the measurement of the concentration of pressor substance in the peripheral blood. Although this has previously been accomplished, the methods used are clumsy and unreliable. Furthermore, mere demonstration of excess pressor substance is not satisfactory since conditions likely to be confused with pheochromocytoma would probably be accompanied with a vigorous discharge over sympathetic pathways, to which the normal adrenal medulla would respond with a massive discharge of epinephrine.[24] Goldenberg, however, has found that pheochromocytomas as a rule contain and presumably secrete predominantly nor-epinephrine, which would not be expected to circulate in the normal person in measurable amounts. The development of a sensitive chemical method of measuring and differentiating epinephrine and nor-epinephrine in the peripheral blood would be of great assistance in the diagnosis of pheochromocytoma and in evaluating the role of these substances in essential vascular hypertension.

In conclusion, while the pharmacological tests so far available may be extremely helpful in confirming the presence of pheochromocytoma, false positive and false negative responses will occur. No one of these tests can be interpreted as absolute evidence for the existense or absence of this tumor. The clinical picture should be regarded as a whole, and in the presence of reasonable doubt abdominal exploration should be performed.

ABSTRACT OF DISCUSSION

DR. KEITH S. GRIMSON, Durham, N. C.: As emphasized in the excellent presentation by Dr. Calkins, routine use of adrenolytic test drugs in all patients with hypertension will establish a diagnosis of pheochromocytoma in a few. Patients with a blood pressure which is normal except for paroxysmal elevations are usually suspected of having pheochromocytoma, and the diagnosis is aided by the use of small doses of histamine, etamon® chloride or other drugs which promote paroxysms. Once the diagnosis has been established surgical removal is indicated. However, the risk of paroxysmal hypertension during operation and subsequent vasomotor collapse occasionally causing death has been associated with surgical intervention in the past. As reported a year ago in THE JOURNAL, preoperative management and control during operation with the use of C-7337, an experimental drug now named regitine, effectively prevented paroxysms and postoperative collapse in one patient. Altogether, three pheochromocytomas have now been removed with the use of intravenous injections of regitine to control hypertension caused by circulating epinephrine. A new direct transthoracic operative approach through the bed of the eleventh rib and through the diaphragm has been employed. The left side is done first and the abdomen explored through an incision in the diaphragm. The adrenal gland is then exposed retroperitoneally through another incision in the diaphragm on the left. If the tumor is not located on this side a similar transthoracic, transdiaphragmatic, retroperitoneal approach is then made through the right eleventh rib bed. The three patients with pheochromocytoma received initially, 0.08, 0.16 and 0.3 mg. per kilogram of regitine intravenously two hours before operation as a test for circulating epinephrine and to reduce blood pressure preparatory to anesthesia. The patient given 0.08 mg. had a reduction of pressure to normal for two hours, after which there was some increase and a second similar injection was given. The pressure again returned to normal. Induction of anesthesia and the start of the operation were possible without increase of pressure, but during the handling of the tumor of the adrenal gland two subsequent injections of 0.16 mg. each were necessary to prevent a rise. After removal of the tumor the blood pressure dropped to 90 systolic and 62 diastolic and then rose to normal after 0.5 cc. of vasopressin injection (pitressin®). Thereafter it remained normal. In two of these patients a benzodioxan (benodaine) test had reduced blood pressure, but in the third this test was equivocable. In each the initial injection of regitine produced a more pronounced and more prolonged reduction of pressure. We are routinely using regitine as well as benodaine as tests in hypertension and will use regitine during operations on any subsequent patients with pheochromocytoma. Unfortunately benodaine, dibenamine,® priscoline® (2-benzyl-4,5-imidayoline hydrochloride) and some other adrenolytic drugs are less effective, less easily controlled or toxic if given in repeated doses. Although much has been said about occurrence of occasional false positive or false negative benodaine tests, all agree concerning the value of its routine use. Probably as with the Wassermann and newer tests for syphilis, accuracy will increase when regitine is employed as an additional test drug. Depression of blood pressure in the absence of a pheochromocytoma does not necessarily mean a false positive test. We have recently observed a patient exhibiting definite reduction of blood pressure following benodaine test and a more pronounced and prolonged depression following regitine test.

19. Spear, H. C., and Griswold, D.: The Use of Dibenamine in Pheochromocytoma, New England J. Med. **239**: 736, 1948. Bartels and Cattell.[3b] Spühler, O.; Walther, H., and Brunner, W.: Zur Diagnose, Klinik und operativen Therapie des Phäochromocytoms: Histamintest und Dibenamin, Schweiz. med. Wchnschr. **79**: 357, 1949.

20. Haimovici, H., and Medinets, H. E.: Effect of Dibenamine on Blood Pressure in Normotensive and Hypertensive Subjects, Proc. Soc. Exper. Biol. & Med. **67**: 163, 1948.

21. Bartels and Cattell.[3a]

22. Litman, N. N., and State, D.: Pheochromocytoma: Use of N,N-Dibenzyl-B-Chloroethylamine (Dibenamine) and Piperidino-Methyl-Benzodioxane (Benzodioxane) in Surgical Therapy, Pediatrics **4**: 735, 1949.

23. Calkins and Howard.[3d]

24. Howard, J. E., and Barker, W. H.: Paroxysmal Hypertension and Other Clinical Manifestations Associated with Benign Chromaffin Cell Tumors (Pheochromocytomata), Bull. Johns Hopkins Hosp. **61**: 371, 1937.

Circulating blood epinephrine was present as judged by the Shingleton method of direct measurement. Operation was not performed because of uremia. As determined by a complete autopsy, this patient had extensive periarteritis nodosa as well as the previously diagnosed uremia, hypertension and syphilis. He did not have a pheochromocytoma. The periarteritis nodosa extensively involved the adrenal glands. This or the other diseases may have caused continuing secretion of epinephrine. It is important, whether elevation of blood pressure is constant or fluctuating, that each patient with hypertension be tested by two or more drugs, for those having a pheochromocytoma should have the tumor removed and can expect cure.

DR. GRACE ROTH, Rochester, Minn.: The first prerequisite for the successful use of these drugs is that the patient shall not have had any sedation for at least 12 hours. An erroneous diagnosis may be made if the test is carried out during a period of sedation. The second prerequisite is that the patient shall not have received any thiocyanate for four to six days, or until there is little or no thiocyanate in the blood. A cold pressor test done first will determine the lability of the blood pressure. Hypertensive patients will show a high rise of pressure, and the test will also demonstrate whether the patient has received or has used sedatives. The rise in the blood pressure after histamine is more excessive than that during the cold pressor test. This fact, along with the clinical symptoms of the spontaneous attack, makes the diagnosis easy when a tumor is present. The dosage of histamine is important; 0.5 mg. will produce a sharp rise and severe symptoms even in a normal person. Do not give this dose. The smaller doses will increase the margin of safety. Usually 0.025 mg. of histamine base is adequate for any clinical test, and as little as 0.01 mg. in a patient with pheochromocytoma will induce a typical spontaneous attack. Thirty seconds after the intravenous injection of histamine there is a fall in the blood pressure. If you do not obtain it at that time but later, check your technic, as there may be histamine in the tissues. An elevation of blood pressure immediately takes place and reaches a peak between one and three minutes; after that, even in the patient with pheochromocytoma, the pressure tends to fall. The exception is in patients with essential hypertension, a labile blood pressure and severe headache, in whom a rise in the blood pressure may be greater four to 10 minutes after the injection than at two minutes. This late rise does not indicate tumor but results from the pain of the headache. If you use mecholyl®, have ready a syringe with atropine in it, because many patients, particularly hypertensive ones, are exceedingly sensitive to this drug. Likewise, etamon® is a longer-acting agent than histamine, although it gives the same type of response. The drop in blood pressure may take place if you change the patient to an upright position. In our hands etamon® has not been particularly reliable. In patients with a persistently elevated blood pressure, benzodioxan, commonly called 933-F, and the longer-acting drug, dibenamine,® also cause a definite decrease in blood pressure in patients with tumors. In patients with essential vascular hypertension there may be a sharp rise in blood pressure and pulse rate except after sedation, when there may be a drop in pressure similar to that produced when a tumor is present. Thus, an erroneous diagnosis may be made. When 933-F, or benzodioxan, is given rapidly and in large amounts, there may be flushing, dizziness, nausea, vomiting, precranial pain and a sharp elevation in blood pressure and pulse rates. Even when benzodioxan is given slowly there is variability in the sensitivity of the patient with hypertension to this drug. Another difficulty has arisen because in these tumors we may have 80 per cent nor-epinephrine and 20 per cent epinephrine, in which case benzodioxan or dibenamine® may not cause a fall in blood pressure and thus may not be diagnostic of such tumors. Therefore, in spite of all these aids, the diagnosis of pheochromocytoma is still difficult to make.

DR. EVAN CALKINS, Baltimore: Dr. Roth has had much experience with the histamine test, which she devised, together with the various other tests for pheochromocytoma, and it was a privilege to hear her discuss some of the pitfalls in their use. There is a great need for a more effective epinephrine competitor which will not, in doses used, influence essential hypertension. For this reason Dr. Grimson's experience with regitine is of considerable interest, although, as he states, more work is needed before it can be evaluated fully as a diagnostic tool. Although Dr. Grimson, like others, has found it advantageous to use epinephrine competitors during operation for pheochromocytoma, we have not found this necessary. In seven of our cases pronounced hypotension developed immediately after ligation of the tumor pedicle, but this was easily controlled in all instances by a continuous dilute epinephrine infusion over a period of several hours. I was glad that Dr. Grimson described his surgical approach in searching for this tumor. An alternative method, which is customarily used for this purpose at the Johns Hopkins Hospital, is through an anterior transabdominal incision. Inasmuch as the tumor may arise from either flank or in a variety of locations throughout the abdomen and is not infrequently multiple, it is clear that, whatever the route, no exploration is complete which does not include examination of the entire abdominal cavity.

MANAGEMENT OF PREGNANCY AND DELIVERY FOLLOWING CESAREAN SECTION

Robert A. Cosgrove, M.D., Jersey City, N. J.

The management of a patient who becomes pregnant subsequent to a cesarean section has been a matter of controversy for over a generation. "Once a cesarean, always a cesarean" is a dictum adhered to by many obstetricians, while another group believes that in certain circumstances it is not only possible but also advantageous to allow such women to be delivered vaginally.[1]

The principal point of contention between these two divergent groups rests in the estimate of the possible danger of rupture of the uterus and the possibility of calamitous results to both the mother and the baby if such rupture does occur. It is further noted by those who subscribe to the aforementioned dictum that cesarean section is now so safe that no one has the right to deprive the mother and her baby of the surety of the avoidance of rupture of the uterus by withholding the operation.

A person's attitude toward such a controversial question is based necessarily on his training, his personal experience and the judicious evaluation of the experience of others as such experience is brought to his attention.

In presenting the statistics of a clinic that does not subscribe to the dictum "once a cesarean, always a cesarean," the following factors are pertinent in the evaluation of the method of handling these patients in use in this hospital. First, we do not believe that cesarean section is yet an entirely innocuous procedure, and we believe that, in spite of the fact that some clinics

1. (*a*) Schmitz, H. E., and Baba, G. R.: Vaginal Delivery Following Cesarean Section, Am. J. Obst. & Gynec. **57**: 669 (April) 1949. (*b*) Watt, G. L.: Rupture of the Uterus, Am. J. Obst. & Gynec. **59**: 490 (March) 1950.

From the Margaret Hague Maternity Hospital.

Read before the Section on Obstetrics and Gynecology at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 28, 1950.

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are able to report series of 1,000 or more consecutive cesarean sections without mortality, it does not yet approach the safety of vaginal delivery.[2] Second, vaginal delivery does not limit the mother's fecundity to the same degree as does repeated cesarean section. Third, the factors that allow the presentation of such

TABLE 1.—*Maternal Deaths Occurring Subsequent to Cesarean Section*

	Total
Live births	
1931 to date	117,139
Deaths	6
Consequent to repeat cesarean section	
Peritonitis	1
Hemorrhage	3
Anesthesia	1
Cerebral hemorrhage	1
Incident to vaginal delivery following cesarean section	0
Due to rupture of scar of previous cesarean section	0

fine statistics as those noted above in relation to the safety of cesarean section, in themselves, because of increasingly adequate technics of operation, tend to prevent the very calamitous results of rupture of the uterus that are feared by those who do repeat cesarean sections rather than allow vaginal delivery.

DATA

Table 1 indicates our basic experience. Among mothers delivering over 117,000 live infants there have been six deaths in pregnancy subsequent to cesarean section. These deaths were all incident to a secondary operation. Of the three deaths from hemorrhage, two were due to placenta previa and might have occurred regardless of the type of delivery. The same situation exists in the case of the woman who died of cerebral hemorrhage. However, the death from peritonitis, the death from anesthesia and perhaps one of the deaths from hemorrhage can be directly attributed to the peril of the operation.

There were no deaths incident to vaginal delivery subsequent to a cesarean section, and there were no maternal deaths due to rupture of the scar of a previous cesarean section.

Table 2 summarizes our experience with ruptures of the uterus through previous cesarean section scars.[3]

TABLE 2.—*Rupture of Uterus Through Previous Cesarean Section Scar*

	No. of Cases	Maternal Mortality	Fetal Mortality
Total ruptures	12	0	4
Complete	5		
Prior to labor	3*		3
During labor	2		1
Incomplete	7		
Prior to labor	3	0	0
During labor	4		

* At 34, 37 and 40 weeks' gestation.

There were five complete ruptures—that is, ruptures of the scar with extrusion of the fetus or placenta through the scar—and all the fetal deaths occurred in this group. I believe it worthy of maximum emphasis that all five of these explosive ruptures, which accounted for our entire fetal mortality in ruptures of the uterus through previous cesarean scars, were all ruptures through classic cesarean section scars. It is also important to note that half of the babies lost were lost owing to rupture prior to the thirty-eighth week of gestation and therefore would not have been saved by elective cesarean section during the last two weeks of the pregnancy.

The incomplete ruptures, that is, those involving a complete separation of the uterine scar but without extrusion of the contents of the uterus into the general peritoneal cavity, occurred seven times, three of which were prior to labor, and in no case was the infant lost. All these incomplete ruptures occurred through low segment scars, either transverse or vertical, and they caused neither fetal nor maternal death. It is important to emphasize that, although ruptures of classic cesarean section scars accounted for five of 12 such accidents, the incidence of classic cesarean sections in the above

TABLE 3.—*Results of Vaginal Delivery by Postcesarean Patients*

	No. of Infants	
Patients delivered subsequent to cesarean section	500	
Patients in whom repeat cesarean section was performed one or more times	321 (64.2%)	
Infants delivered by subsequent cesarean section		368
Patients delivered vaginally one or more times subsequent to cesarean section	179 (35.8%)	
Infants delivered vaginally		221

TABLE 4.—*Patients Delivered by Cesarean Section and by Vagina*

	Cases	
	No.	%
Indications for initial cesarean section		
fetopelvic disproportion	414	
Delivered subsequently by cesarean section	300	
Delivered subsequently by vagina	114	27
Placenta previa	29	
Cesarean section	8	
Vagina	21	74
Toxemia	16	
Cesarean section	3	
Vagina	13	81
Abruption of placenta	15	
Cesarean section	3	
Vagina	12	80
Obstructive tumor	7	
Cesarean section	2	
Vagina	5	72
Other	19	
Cesarean section	14	
Vagina	5	26

noted experience amounts to less than 1 per cent of all cesarean sections that we see in subsequent pregnancies, whether done in our own or in other hospitals.

Table 3 indicates the results of our experience in allowing certain mothers to go into labor and deliver vaginally, if able, after a previous cesarean section. Of 500 patients seen with a pregnancy following an initial cesarean section, 321 (64.2 per cent) had had cesarean section repeated one or more times, with the delivery of 368 infants. One hundred and seventy-nine (35.8 per cent) of the patients seen after an initial section were allowed to deliver vaginally one or more times, with the delivery of 221 infants.

Table 4 exhibits the indications for the initial cesarean section, and the number of patients in each category delivered by repeat cesarean section and those delivered subsequently by vagina. Four hundred and

2. (*a*) Dieckmann, W. J., and Seski, A. G.: Cesarean Section at the Chicago Lying-In Hospital—1931 to 1949, Surg., Gynec. & Obst. **90**: 443 (April) 1950. (*b*) D'Esopo, D. A.: A Review of Cesarean Section at Sloane Hospital for Women, 1942-1947, Am. J. Obst. & Gynec. **59**:77 (Jan.) 1950.

3. Donnelly, J. P.: Am. J. Surg., to be published.

fourteen patients were subjected to cesarean section initially for fetopelvic disproportion; in this group are also included those who were operated on for uterine inertia. Of these patients 114, or 27 per cent, delivered subsequently by vagina.

In 29 cases delivery of an infant by cesarean section because of placenta previa was followed by subsequent delivery of 74 per cent by vagina. In the group of 16 patients with toxemia 13, or 81 per cent, were subsequently delivered by vagina. There were 15 initially operated on for abruption of the placenta. Of these, 12, or 80 per cent, were delivered by vagina. In seven cases of obstructive tumor there were five deliveries by vagina, and a miscellaneous group of indications, including elderly primigravidas, prior vaginal surgery, fetal interest, etc., resulting in the delivery of five out of 19 (26 per cent) by vagina.

Table 5 indicates the methods of vaginal delivery following cesarean section in all categories.

TABLE 5.—*Methods of Vaginal Delivery Following Cesarean Section**

	S.D.	L.F.	M.F.	Other
Fetopelvic disproportion	71	42	9	4
Placenta previa	22	5	3	0
Toxemia	11	6	0	0
Abruption	18	3	0	0
Tumor	4	3	0	0
Other	13	7	1	0
	139	66	13	4

* Average length of labor 13 hours.

COMMENT

In considering the question of repetition of cesarean section, we feel that it is most difficult and sometimes impossible to assess the factors that are involved in fetopelvic disproportion. Of the several elements, we believe that we are in a position to determine accurately only the outline of the pelvic architecture.[4] In regard to the size, moldability and tolerance of the fetus to relative degrees of disproportion, we feel there are no certain modalities of accurate interpretation. Further, in spite of earnest endeavors to investigate the behavior of the myometrium in labor,[5] information remains scanty and as yet not applicable to the average practice of obstetrics. It is my impression that in many cases in which pregnancy is terminated by cesarean section for fetopelvic disproportion in reality operation is done because of inefficient functioning of the uterine musculature. Accurate diagnosis and effective treatment of such dyskinesia would cause a considerable drop in the initial incidence of at least our own cesarean sections. In our series the average length of labor prior to the initial cesarean section was over 24 hours, and yet 27 per cent of these patients subsequently delivered by vagina after an average labor of only 13 hours. It is in this group of patients who have been subjected to cesarean section for relative disproportion or uterine inertia, in which the latter is probably the more important factor, that we have the greatest opportunity of avoiding operative delivery in subsequent pregnancies. We have not found any consistency of the pattern of uterine contractions in a series of pregnancies and do not believe that an initial inadequacy of uterine contractions in one pregnancy necessarily implies a similar uterine reaction in subsequent pregnancies. The mental reaction of the patient to her labor and its relation to inertia in themselves constitute a subject worthy of much discussion.

Our basic philosophy of management therefore involves allowing patients who have had a prior cesarean section to progress through pregnancy until the onset of natural labor. This insures maturity of the fetus in the highest degree possible and averts the occasional detrimental effects of premature delivery caused by inaccurate menstrual history or faulty estimate of fetal size. This procedure was followed for all of the patients who delivered vaginally and for 178 patients who were subjected to repeat cesarean section.

At the onset of labor, patients are examined very carefully and an evaluation is made of the pelvic capacity, the size of the infant and the character of the uterine forces. We believe that the single most important prognostic element is the station of the presenting fetal pole. If engagement is present or appears probable within a short time, labor is allowed to proceed normally. If the prognosis is unfavorable, the labor is terminated by cesarean section. The average length of labor in those patients who were subjected to secondary cesarean section was less than 10 hours. If the patient has had more than one cesarean section, we allow her to show some evidence of labor, that we may be sure the period of gestation is accomplished, and then do cesarean section. Though this may be inconvenient at times, we are conservative concerning vaginal delivery and make no effort to produce labor at predetermined times by artificial means. We similarly believe that termination of a pregnancy by cesarean section should be done at the time it is medically necessary and that if facilities for such management are not available there exists a lack of proper safeguards for the welfare of the mother and her baby.

On the admission of patients with cesarean section scars, we surround them with the best precautions of which we are aware. Blood in sufficient quantity is available in the blood bank, cross matched and reserved for the patient in labor. This may at times present a problem in providing Rh-negative blood of the less common types, but it is not insurmountable if properly qualified technicians are continually available. Competent personnel are in constant attendance. This involves the presence of the attending obstetrician or a senior member of the resident staff in the labor room area at all times. The responsibility of observing the labor of a patient with a previous cesarean section scar cannot be left to the judgment of nurses or of junior house officers. An operating room is constantly available. It is recognized that some institutions cannot physically provide such service, but we believe that the measure of their inability to do so is the measure of their inade-

4. (*a*) Caldwell, W. E., and Moloy, H. C.: Anatomical Variations in the Female Pelvis and Their Effect in Labor with a Suggested Classification, Am. J. Obst. & Gynec. **26**: 479 (Oct.) 1933 (*b*) Thoms, H.: The Obstetric Pelvis, Baltimore, Williams & Wilkins Company, 1935.

5. (*a*) Steer, C. M., and Hertsch, G. J.: Electrical Activity of the Human Uterus in Labor: The Electrohysterograph, Am. J. Obst. & Gynec. **59**: 25 (Jan.) 1950. (*b*) Delson, B.; Lubin, S., and Reynolds, S. R. M.: Pattern of Braxton Hicks Contractions and the Gradient of Uterine Activity During the First Stage of Labor: A Study with the Multichannel Tokodynamometer, ibid. **59**: 795 (April) 1950.

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quacy in providing complete safety for the obstetric patient—or for any other type of patient with an acute surgical emergency. In such circumstances we believe that if labor progresses normally cesarean section is an intervention that decreases rather than increases the safety of the mother and her infant.

There are, in addition, secondary factors that tend to sway us in our decision to allow labor to continue. Of these, the type of operation is the most important. We believe that a transverse lower segment incision is superior to all other types, and our experience tends to confirm us in the opinion that it is the least dangerous as a source of subsequent rupture. Except in a small group of patients who present mechanical difficulty such as cervical myomas, we believe that classic cesarean section is an outmoded, obsolete and dangerous operation. A properly trained operator can perform a low transverse section with at least as much facility, with negligible difference in time and with lessened blood loss.

Information about the character of the postoperative course of the first operation, if available, is important, particularly if the patient evinces any abnormal reaction in the scar area. However, unless the area was actually grossly infected after the primary operation, we do not feel too concerned about morbidity, since varying degrees of febrile reactions occur in about one third of such operations. In the relatively few ruptures in the present series of patients there was no significant correlation between morbidity and rupture.

We have seen many scars at reoperation, and by examining the uterus after vaginal delivery we have palpated a number of previous cesarean section scars and generally are impressed by the thinness of such tissues. We have not felt that there is very much difference, however, between such scars and the unoperated lower segment often seen at initial cesarean section in cases of neglected prolonged labor. While it is well known that the uterine scars heal with varying degrees of muscular and fibrous repair, we feel that they are usually more competent than they are generally credited with being. Scar tenderness is generally regarded as a danger sign of impending rupture, but our experience has caused us to consider it rather uncertain evidence. We have not seen any ruptures where scar tenderness alone was present, and we have operated on several individuals, fearing an impending rupture because of the degree of tenderness, only to find a firm intact scar on the uterus itself. Though we are without statistical data, it is our impression that such tenderness is from the abdominal rather than from the uterine scar.

SUMMARY

A series of 500 patients who were delivered subsequent to cesarean section is presented in which 35.8 per cent were successfully delivered vaginally.

There were no maternal deaths from ruptures of the previous cesarean section scars and six deaths incident to subsequent cesarean section.

Under proper conditions patients who have had a cesarean section may be safely allowed to demonstrate their capacity to deliver vaginally subsequent to cesarean section.

ABSTRACT OF DISCUSSION

DR. W. B. THOMPSON, Los Angeles: While Dr. Cosgrove states that at the onset of labor the patient is carefully examined and her potentialities are evaluated, I am not clear as to how the unknowns in the equation are solved. Aside from determining the degree of engagement of the presenting part and the presence or absence of pain in the scar area, it would seem that what Dr. Cosgrove proposes is essentially to follow a "wait and see" policy. It is confusing to assume, because vaginal delivery carries a lower over-all mortality rate than does cesarean section, that vaginal delivery after cesarean section places itself automatically in the safer category. Better technic at operation and more anatomical selection of the site of incision have given stronger scars, but scars, nonetheless—without the resilience and tensile strength of the tissues they have replaced. That there are fewer ruptures of these scars prior to labor is in itself a considerable advance. Why gamble this gain on the doubtful outcome during the hammering process of labor? Note well the precautions listed by Dr. Cosgrove. Competent personnel in constant attendance are seldom available save in teaching institutions. Blood in quantity is more easily provided. But to have an operating room set up in reserve, with nurses and anesthetists standing by, is practically impossible in private hospitals. Probably too many cesarean sections are performed, but as I look back the cesarean sections that have worried me the most are the ones I elected not to perform. Our experience at the Cedars of Lebanon Hospital has not justified Dr. Cosgrove's reasoning. Repeat cesarean section is accepted as fully justified. Since the opening of the hospital, in May 1930, to January 1, 1950, not one of the 741 repeat cesarean patients has failed to survive, and the series is not yet ended to date. In this period there is a series of 1,609 consecutive cesarean sections without a death. No uteri were sacrificed because of scars rupturing during labor. I cannot feel that Dr. Cosgrove's plan of inaction can safely be applied generally. The cost in money and in lives lost is too much to risk on the evidence of 179 postcesarean patients delivered vaginally, with six scars rupturing during labor. When Dr. Cosgrove can return with a series of a thousand such deliveries without fetal or materal loss chargeable to the conduct of labor and without needless sacrifice of uteri, especially if he can reveal additional procedures of prognostic value, I shall be much interested, and much surprised.

DR. ROBERT A. JOHNSTON, Houston, Tex.: In order to ascertain the usual method of delivery practiced in my own community, 25 obstetricians in Houston, Texas answered a questionnaire. While the absolute correctness of these statistics relating only to their private cases may be questionable, it is felt that the questionnaire presents a true picture of this community and allows an opinion to be voiced. In approximately 65,000 private cases attended by this group, there are listed only 14 cases of rupture of a cesarean section scar. According to the terminology used by Dr. Cosgrove, there were six complete and eight incomplete ruptures of this type. There were no mothers lost, and in only two instances, or 14 per cent of the cases, was a hysterectomy performed. Also to obtain a more complete and accurate picture of the local situation the records from four hospitals in Houston were reviewed. During the years 1939-1949, inclusive, there were 15 cases of ruptured uterine scar occurring in 91,526 deliveries. No doubt there is an overlapping of cases in the two analyses; however, in neither instance did a maternal mortality occur, and in the report from the hospital, the infant salvage was six, or 40 per cent, in comparison with the private physicians' cases of eight, or 57 per cent. There is a diversity of opinion as to a physician's ability to detect impending or beginning rupture of the uterine scar, even though he is in constant attendance. Ten replies from the Houston physicians were definitely "yes"; eight physicians were doubtful, and seven were equally sure that one could not definitely detect an impending rupture. It was the policy of 14 members contacted to treat all patients by repeat cesarean regardless of parity, engagement of the head or previous indication for the operation. The remaining 11 physicians attempted to individualize and subscribe to vaginal delivery when possible. In cases of

febrile puerpera, there was a marked preponderance of, but not unanimous, opinion in favor of abdominal delivery. Twenty-two replies stated that the classic section scar was more likely to rupture than was either the transverse or the vertical lower cervical scar. To substantiate the statement that vaginal delivery does not limit the mother's fecundity to the same degree as repeated cesarean section does, only seven such cases were found in a report from the hospital where four or more cesarean sections were performed. My feeling is that rupture of the uterine scar should not be attended by the tremendous fear for the mother that is usually felt by the profession or by the laity; that the use of the transverse low cervical incision will markedly decrease the instances of complete rupture of the uterus; that rarely does a uterus have to be removed on account of a ruptured scar per se, and that by individualizing each case as to previous history, suitability of cervix, station of head and parity, a considerable number of vaginal deliveries have occurred—a fact that speaks for a more critical and favorable evaluation of such a plan as is advocated by Dr. Cosgrove.

DR. ROBERT A. COSGROVE, Jersey City, N. J.: I knew that I would get an opposing argument when I asked Dr. Thompson to discuss this paper. In spite of arguments to the contrary, my purpose here was to show that it could be done. I have been upset to find that in some sections of the country it practically amounted to malpractice if one did not immediately do a repeat section in such cases. Dr. Johnston's statistics certainly indicate that the manner of caring for these people is not yet standardized and that it will continue to be controversial until sufficient statistics are amassed throughout the country to show a certain definite safe trend. Incidentally, because a patient has had one vaginal delivery following a cesarean section the possibility of rupture does not disappear. I have had one such patient in whom rupture occurred in her fifth pregnancy, when she had had her initial and only section with her first pregnancy. I also had one patient who delivered 12 full term babies with an average weight of 8½ pounds (3.8 Kg.) after her initial and only cesarean section.

1. Peirce, E. C., II; Gross, R. E.; Bill, A. H., Jr., and Merrill, K., Jr.: Tissue-Culture Evaluation of the Viability of Blood Vessels Stored by Refrigeration, Ann. Surg. **129**: 333 (March) 1949. Gross, R. E.; Hurwitt, E. S.; Bill, A. H., Jr., and Peirce, E. C., II: Preliminary Observations on the Use of Human Arterial Grafts in the Treatment of Certain Cardiovascular Defects, New England J. Med. **239**: 578 (Oct. 14) 1948. Gross, R. E.; Bill, A. H., Jr., and Peirce, E. C., II: Methods of Preservation and Transplantation of Arterial Grafts, Surg. Gynec. & Obst. **88**: 689 (June) 1949.

The Fascial Spaces of the Palm.—Any reference to the literature must begin with an acknowledgment to Kanavel, Professor of Surgery in Chicago, for his pioneer work in this field. Until the publication of his *Infections of the Hand* in 1912 the presence of the fascial spaces and their relationship to disease had excited little interest. Few relevant facts were recorded by anatomists before this time, despite meticulous attention to detail in this region, for the clinical significance of the cellular tissues far outweighs their anatomical importance. As Dubau (1927) pointed out, the "noble structures" of the hand had held the center of the stage. Thus it is that in the standard textbooks of the late nineteenth and early twentieth centuries little was written about the fascial spaces, and even today satisfactory accounts are by no means universal. . . .

Kanavel's research extended over twenty years, culminating in the publication of his book in 1912. Using freshly amputated hands from which macroscopical transverse sections were made, he confirmed the existence of these three spaces. By the further study of 56 dissecting-room hands, employing a method of injection of plaster-of-Paris or red lead with subsequent dissection and radiography, their boundaries were carefully determined and their mode of communication with adjacent structures was established. Clinical findings supported his anatomical conclusions.—J. Gardner Jamieson, O. B. E., *The British Journal of Surgery*, October 1950.

THE BLOOD VESSEL BANK

Edward B. C. Keefer, M.D.
William DeW. Andrus, M.D.
Frank Glenn, M.D.
George H. Humphreys II, M.D.
Jere W. Lord Jr., M.D.
Wallace B. Murphy, M.D.
and
Arthur S. W. Touroff, M.D., New York

Homologous vascular grafts preserved in a blood vessel bank have proved their value clinically, and indications for their use are steadily growing. This stimulating contribution to surgery passed the early experimental stage when Gross and his associates reported the first use of homologous vascular grafts in human patients.[1] Since then the use of blood vessel grafts has become well recognized in the surgical treatment of coarctation of the aorta, aneurysms and malignant conditions necessitating the sacrifice of a vital blood vessel.

Establishment of blood vessel banks now seems desirable in large cities where cardiovascular surgery is performed. In New York city more than one bank is impractical because a large number of hospitals are necessary to provide donor material in sufficient quantity. At present, difficulty in obtaining permission for autopsy and the small number of autopsies at which suitable donor material can be obtained limit the number of grafts that can be obtained. Secondly, owing to individual variations in sizes of blood vessels, a choice of different-sized grafts is desirable, and with the shortage of material a central storage depot is more efficient. The shortness of storage time of the grafts (from four to six weeks) also means more must be available. Therefore the blood vessel bank draws on all available New York hospitals. The method of storage will undoubtedly be improved, and it is hoped that the actual existence of a successfully functioning blood vessel bank, such as the New York bank, will help to inform the laity of its value and thus aid in removing one of the major obstacles to success, the difficulty in obtaining autopsy permission for grafts. Eventually large cities should be able to supply the adjacent smaller communities.

Experience in operating the New York bank has shown that the time factor constitutes one of the difficult problems in maintaining an adequate supply of donor material. A graft should be taken as soon as possible, preferably not later than six hours after death, and this demands rapid action by the house staff in obtaining permission for complete autopsy and clearing the permit through the hospital administration.

Cooperation by the pathology department is also essential. Removal of blood vessels delays an autopsy about 45 minutes, and it is only natural that the persons directly concerned with the basic purpose of the autopsy—namely, to shed light on disease processes—might find this delay a marked impediment to successful completion of their tasks, especially when the staff is

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limited. Further, they are already working against time, owing to the progressive autolysis, which distorts the microscopic pathology for the pathologist, and also frequently at the insistence of the mortician. The pathologists recognize the importance of supplying other departments with research and homologous graft materials and, although they are considerably inconvenienced, feel that the potential promise makes this effort worth while.

The house staff should be made aware not only of the importance of the time element but of the type of donor most suitable. Donors should preferably be under 45 years of age. The material selected should be free of malignant, certain infectious and marked degenerative diseases.

As many hospitals as possible should participate in supporting a single bank, since a single large hospital does not have appropriate material in sufficient quantity

Autopsies Done at the New York Hospital-Cornell Medical Center and the Presbyterian Hospital from May 14, 1949 to May 14, 1950

	New York Hospital	Presbyterian Hospital
Total number of autopsies	446	472
Number of autopsies on patients 3 years old or less *	170	171
Number of autopsies on patients more than 3 years old †	276	301
Number of autopsies on patients more than 45 years old		
Done more than 6 hours post mortem	78	117
Done within 6 hours post mortem	118	92
Number of autopsies on patients 3 to 45 years old		
Done more than 6 hours post mortem	34	49
Done within 6 hours post mortem	46	43
Unsuitable for supplying donor grafts ‡	18	17
Suitable for supplying donor grafts	28	26

* Most of these patients were in the first year of life, newborn or stillborn.

† Aortas or larger arteries from children 3 years old or less are probably not of sufficient caliber to be utilized as donor grafts. Although vessels of children over 3 years of age could be of value for grafts, autopsy is seldom done on children of this age. Autopsies on persons 3 to 45 years old are probably the best sources for grafts.

‡ In these autopsies gross pathological conditions made the vessels unsuitable for grafting.

(table). The table shows that the number of autopsies in this year at the New York Hospital from which usable donor grafts could be expected to be obtained is 28, or 6.2 per cent of all the autopsies done, or 10.1 per cent of all the autopsies done on human beings over 3 years old at this hospital. Results of a separate survey at the Presbyterian Hospital are very similar. Other sources of material, such as penal institutions, should be investigated. Medicolegal deaths are extremely desirable as a source of donor grafts. The medical examiner is able to approve routine autopsy, which is all that is necessary for obtaining grafts, and many of these deaths are suicides, accidents and homicides occurring in young, healthy persons.

The cost of setting up and maintaining a blood vessel bank is high but justifiable when its value in cardiovascular surgery is considered. Expensive equipment is required, some of it standard in large hospitals. The asepsis involved, which is similar to that of conducting a surgical supply room, adds greatly to the maintenance cost. Adequate research facilities of an experimental surgical laboratory are desirable as a proving ground and for use in further investigation. The blood vessel bank which has been functioning at the New York Hospital-Cornell Medical Center and Bellevue Hospital was set up with these conditions in mind.

At the present time, two surgeons and one surgical nurse constitute the personnel of the bank. It is hoped that eventually each hospital cooperating with the bank will have a specially trained house staff team on call, so that donor grafts may be taken under ideal conditions in the operating room and with minimum delay. The teams would be supplied with storage bottles and solutions or would place the grafts in sterile Ringer's solution and refrigerate them until they are picked up by the bank. Such a plan might permit reduction of the bank staff to one competent, specially trained surgical nurse-technician with an experienced surgeon to designate whether a graft is safe to use and to supervise the bank procedures. At present, the bank surgeons are on call to the various hospitals when donors are available. This program usually necessitates taking the grafts in the autopsy room, which means that the bank surgeons must carry with them the sterile surgical equipment for this procedure.

Adequate space for equipment is a requisite for careful work and a safe and efficient bank. A fairly large laboratory is required, equipped for certain biochemical, physiological and bacteriologic procedures. Adjoining office space is needed for keeping records and for desk work. The laboratory contains the following items:

1. A large blood-bank type refrigerator with a constant temperature fan replacing the ice cube compartment. This is for storage of both grafts and solutions. Since the solutions are buffered with sodium bicarbonate, on exposure to air and heat they form carbonate, altering the pH. In addition, refrigeration slows metabolism, slows the growth of contaminants in solutions not yet sterilized and also in the so-called sterile solutions and prolongs the pH balance, buffer potency and chemical equilibrium.
2. A recording thermometer that at all times records on a chart the temperature within the refrigerator.
3. A domestic refrigerator for bacterial culture controls and for storage of unsterile material. By this separation of the unsterile from the relatively sterile material, contamination of the grafts is less likely to occur.
4. Two large suitcases containing two complete surgical kits, sterile drapes, instruments and equipment to be transported to the various hospitals by the bank surgeons.
5. A fully equipped laboratory bench with gas jets, wall suction apparatus, etc.
6. Acid-resistant sinks and drainboards.
7. Hood, for working with acid and gases, with blower to remove fumes.
8. Adequate storage cupboards and space for laboratory apparatus and glassware.
9. Beckman pH meter.
10. Accurate weighing balance.
11. Still for providing triply distilled water.
12. Centrifuge.
13. Constant temperature incubation oven.
14. Drying oven (hot air).
15. Autoclave.
16. Steam sterilizer.
17. Special Seitz filtration apparatus.

Animal quarters and operating room with special surgical instruments and other operating room supplies are essential for carrying out the research. Laboratory space and equipment for the research are also a necessary part of such a project.

The bank utilizes the method of storage described by Gross and associates.[1] In setting up this bank a number of problems were encountered that necessitated various changes in equipment, technic and preparation and sterilization of solutions. These variations have been proved satisfactory, both experimentally in animals and by successful transplantation of homologous grafts in human patients, for the short period of a few months postoperatively. Only time will tell their lasting value. The early results are encouraging.

The basic solution used in preserving the grafts is a buffered salt solution (modified Tyrode solution),[2] to which is added 2.5 per cent penicillin, 2.5 per cent streptomycin and 10 per cent human serum. This nutrient medium permits storage of the grafts as long as six weeks and possibly longer. Steps of the complete bank procedure are as follows:

The buffered salt solution is sterilized by filtration (fig. 1) and a measured amount of the sterile solution is introduced into a previously autoclaved individual storage bottle (fig. 2 *A* and *B*). This solution is stored in a refrigerator until needed (fig. 2 *C*). When the graft is obtained, the special skirt type Fenwal rubber bushing may be removed and the graft placed in the bottle without contaminating the neck of the bottle or the inner surface of the bushing (fig. 2 *D* and *E*).

The graft is now returned in the tightly stoppered bottle to the bank refrigerator. Before refrigeration storage, a sample of the solution into which the graft has been placed is obtained for sterility check by inserting a needle through the thin center portion of the rubber bushing (fig. 2 *F*) with observance of the usual aseptic precautions. After this procedure, the serum and the antibiotics are added in a similar manner (fig. 2 *G*). The graft is now refrigerated at 36 F. until required. The bottle should be filled no more than two thirds full, since oxygen is needed for preservation of the graft (fig. 5).

The following method of the preparation of the storage solution prevents precipitation and excessive alkalinity or variation of pH.

Only reagent salts are used. Approximately 1,800 cc. of triply distilled water is placed in a 2,000 cc. graduate, and the various ingredients are added one at a time in the order designated. Each substance is distributed throughout the entire volume of the solution before the next is added. This precaution is necessary to prevent high local concentrations of any one ingredient. When the mixture has been completed, triply distilled water is added to make a total volume of 2,500 cc. of solution. Since this is a diluted solution and is kept refrigerated, it is not necessary to add chloroform preservative. The pH is now measured; it should range from 7.4 to 7.8. This solution is now sterilized by Seitz filtration, with special burette apparatus (fig. 1).[3] After filtration a bacteriologic check is done.

ADVANTAGES OF FILTRATION STERILIZATION OF BUFFERED SALT SOLUTION

With filtration sterilization, the dilute buffered salt solution may be made up, the sodium bicarbonate added and a measured amount of sterile solution placed in the individual storage bottles in one procedure. Thus, by simplification, several separate autoclavings of solutions and mixings under aseptic conditions are eliminated and at the same time the chances of contamination are reduced to a minimum.

Filtration sterilization is as effective in reducing bacteria for this type of solution as autoclaving. It has been used by tissue culture workers for more than 25 years. It will not remove virus and rickettsial organisms, but it does eliminate spore forms of organisms and certain other bacteria that are not destroyed by autoclaving. If ultraviolet irradiation could also be used, probably this method would be completely satisfactory.

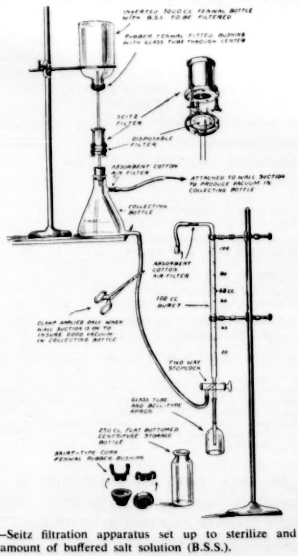

Fig. 1.—Seitz filtration apparatus set up to sterilize and deliver a measured amount of buffered salt solution (B.S.S.).

The Seitz filter is probably preferable to the Berkefeld filter, since it is easily autoclaved and the filter is used only once, whereas the Berkefeld porcelain filter is difficult to clean and sterilize after each use.

SEITZ FILTRATION PROCEDURE

The individual storage bottles are autoclaved in a wire basket (fig. 3). A piece of paper is tied over the top and neck of each bottle (fig. 2 *A*). The rubber bushings are separately autoclaved, wrapped in cloth packages of eight.

A special Seitz filter is set up as shown in the diagram with the inverted solution bottle supplying a steady flow to the filter.

2. The buffered salt solution is prepared according to the following formula:

	Gm. or Cc.
1. Sodium chloride, NaCl	30.0
2. Potassium chloride, KCl	1.0
3. Magnesium sulfate, $MgSO_4 \cdot 7\ H_2O$	0.2
4. Magnesium chloride, $MgCl_2 \cdot 6\ H_2O$	0.2
5. Calcium chloride, $CaCl_2$	0.35
(This is dissolved separately in 100 cc. of triply distilled water before it is added to the previous completely dissolved solution.)	
6. Dibasic anhydrous sodium phosphate, Na_2HPO_4	0.15
7. Monobasic potassium phosphate, KH_2PO_4	0.15
8. Dextrose (*d*-glucose) $C_6H_{12}O_6$	2.5
9. Phenol red (1 per cent solution)	5.0
10. Triply distilled water sufficient to make	2,500.0
11. Freshly made up sodium bicarbonate solution (1.4 per cent) $NaHCO_3$	62.5

Instead of dibasic anhydrous sodium phosphate, we use 0.28 Gm. of dibasic sodium phosphate $Na_2HPO_4 \cdot 7\ H_2O$; one could also use 0.38 Gm. of $Na_2HPO_4 \cdot 12\ H_2O$.

3. Tyrode's solution cannot be autoclaved since it may become cloudy or precipitate, which may or may not be visible, and the pH may be changed, usually resulting in alkalinity. One cannot always be sure of the composition or isotonicity of the solution after excessive heating.

After filtration, the individual storage bottles are filled under the usual sterile precautions with a measured amount of buffered salt solution and corked tightly. A sterility check is made on this filtered solution for anaerobic and aerobic bacteria and fungi. The pH is also checked after filtration.

PREPARATION OF VACUUM BOTTLES FOR DONOR BLOOD AND SERUM EXTRACTION

Acid-cleaned flat-bottomed 250 cc. centrifuge bottles (specially tooled bottles fitted for rubber Fenwal bushings) are (1) thoroughly rinsed first in tap water and then in distilled water; (2) autoclaved without corks, then dried in a dry heat oven without corks, and then immediately corked before moisture condenses on the inside of the bottles; (3) autoclaved with rubber bushings held on tight by specially designed apparatus (fig. 4) for 30 minutes at 20 pounds' (9.1 Kg.) pressure at 259 F. A vacuum is created in these bottles by aseptic removal of the air.

PREPARATION OF SERUM

Donor blood is drawn into a specially prepared centrifuge bottle. It is necessary to prepare vacuum bottles for serum, since most hospitals no longer pool their own plasma because of serum hepatitis. The pharmaceutical houses only make up plasma and fractioned serum products such as serum albumin. Some offer scarlet

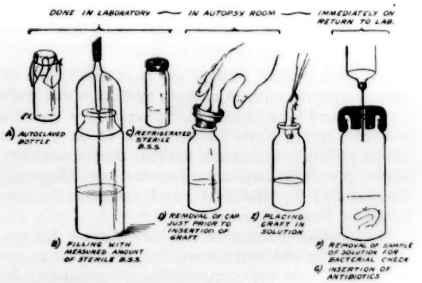
DONE IN LABORATORY
IN AUTOPSY ROOM
IMMEDIATELY ON RETURN TO LAB.
A) AUTOCLAVED BOTTLE
B) FILLING WITH MEASURED AMOUNT OF STERILE B.S.S.
C) REFRIGERATED STERILE B.S.S.
D) REMOVAL OF CAP JUST PRIOR TO INSERTION OF GRAFT
E) PLACING GRAFT IN SOLUTION
F) REMOVAL OF SAMPLE OF SOLUTION FOR BACTERIAL CHECK
G) INSERTION OF ANTIBIOTICS

Fig. 2.—Major portion of the complete bank procedure. Steps are carried out in the order designated.

fever serum, which is ordinary serum taken from patients who have had scarlet fever and is pooled and irradiated to remove the hepatitis viruses. This serum should be quite satisfactory. Serum is prepared at the New York blood vessel bank in the following manner:

Donor blood is drawn with a large caliber constant bore silicone-lined needle. The blood is not disturbed or agitated, but immediately centrifuged, then refrigerated overnight and centrifuged again within the next twenty-four hours to remove most of the fibrin clot and prevent hemolysis. The serum is then immediately extracted and refrigerated until used. It may be kept at room temperature for a long time if it has been irradiated and asepsis is reasonably assured. The serum is not pooled but is from a single blood group, i. e., known professional donors.

ANTIBIOTIC PREPARATION

The concentration of antibiotics in the storage solution is 2.5 per cent penicillin and 2.5 per cent streptomycin. It appears that when the strength of penicillin is above 5,000 to 10,000 units and streptomycin above 500 to 1,000 units per cubic centimeter of solution, tissue culture growth is probably definitely inhibited.[4] A concentration of 50 units per cubic centimeter in the solution has proved satisfactory at the New York bank.

BACTERIOLOGY

Bacteriologic sterility checks for aerobes, anaerobes and fungi are done with the following culture mediums: infusion broth, liver dextrose broth and sodium thioglycolate broth. It is usually easy to determine by this method whether contamination is present. These cultures should probably be done by the hospital bacteriology department because of their specially trained personnel.

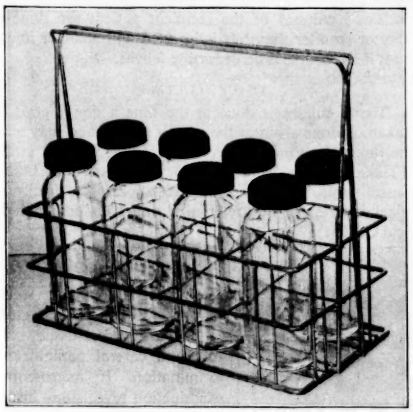

Fig. 3.—Bottles, rubber bushings and wire basket. The individual storage bottles are autoclaved without stoppers in a wire basket.

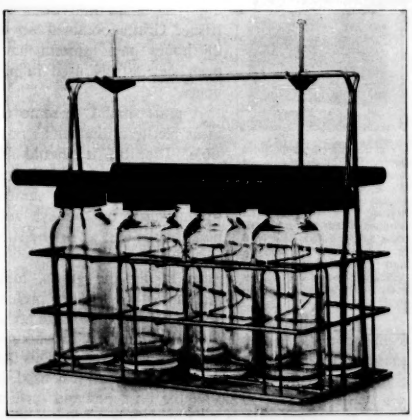

Fig. 4.—Apparatus for holding on Fenwal rubber bushings during autoclaving of previously autoclaved open-mouthed bottles.

An endeavor is made to keep the bacteriology checks to a required minimum, because each check is a possible source of contamination. As previously mentioned, culture check is done on the filtered buffered salt solu-

4. Parshley, M.: Personal communication to the authors.

tion and on the serum after extraction. At the time the donor graft is taken, the peritoneal and pleural cavities are cultured and the graft is placed in the storage solution and the solution cultured. The serum and antibiotics are then added, and bacterial check may again be made. Final check is made at the time the graft is used, or, if possible, just prior to its use.

Blood cultures of the recipient patient are done a day or so after the graft is inserted and at other intervals if the course is considerably febrile.

TISSUE CULTURE

Tissue culture is done at the time a donor graft is taken, is done again at the time it is used and may also be done at various stages during storage of the graft. (Tissue cultures were done for the New York blood vessel bank by the tissue culture laboratory of the surgical department, Presbyterian Hospital, Columbia Medical Center.)

PATHOLOGY

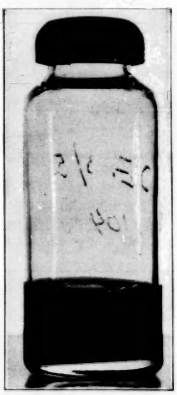

Fig. 5.—Individual specimen bottle. The bottle should be filled no more than approximately two thirds full, since oxygen is needed for preservation of the graft. The bottle contains exactly 68 cc. of buffered salt solution, exactly 8 cc. of homologous serum, exactly 2 cc. (4,000 units) of penicillin solution and exactly 2 cc. (4,000 units) of streptomycin solution.

When a donor graft is taken during an autopsy, a small part of the prospective graft is set aside for tissue culture and careful pathological examination. If microscopic examination reveals any histopathologic alterations from the standard accepted normal, the graft is discarded at once.

The sooner a graft is obtained after death the better, obviously, since there is less autolysis and destruction of tissue. Grafts obtained up to 28 hours post mortem have been successfully used in patients.

A graft should be removed in as sterile a manner as possible. Ideally, it should be taken in the operating room under surgical asepsis similar to that used by the eye and bone banks and as in any surgical procedure.

In taking the grafts, long sections of vessels are preferable, such as the thoracic aorta from just distal to the left subclavian artery to where it goes through the diaphragm. Since the surgeon trims the graft to the necessary length required when it is used, it is a waste of effort to tie all the branches and further delays the pathologist. A tie not only is a foreign body and may be a nidus for infection but may cut through the stored tissue, the viability of which has been impaired, may break during storage or slip off because of the absence of fibrin and the agglutinizing of tissue usually encountered in wound healing. If the branches are left untied, the surgeon is able to make a thorough check of all branches for leakage. The branches are easily transfixed after they have been stored for a short while.

The vessel sheath is left on when the graft is obtained and the vessel dissected as cleanly as possible. The sheath probably aids in the strength of the graft after it has been implanted, although it is possible that its removal might enhance the blood supply to the peripheral adventitia and the serosal cuff that forms around the graft in its new bed. It is an interesting fact that the cuff that forms is probably the strongest part of the graft and that the new blood supply enters this cuff from the periphery, whereas vessels, as a rule, receive their nutriment from their lumen and vasa vasorum.

The graft should be thoroughly washed, and rinsed in Ringer's solution or buffered salt solution before it is put into storage and also before it is used.

Grafts are transported to the surgeon in a specially made refrigerated container in order that those not used are not damaged. A period of two or more hours at room temperature probably increases metabolism and further autolysis and undoubtedly impairs tissue growth.

COMPARISON OF NUTRIENT MEDIUM AND FROZEN STORAGE

The quick freezing method may have one definite advantage over the nutrient medium method in that grafts may be stored for a longer time. However, it is probable that these frozen grafts are not viable so far as tissue culture growth is concerned, but they do act as a satisfactory prosthesis surgically. This fact was adequately demonstrated by Hufnagel[5] and subsequently confirmed by Deterling and associates.[6]

Investigations on dogs at this bank suggest that vessels stored by the nutrient medium method over approximately eight weeks are usually not satisfactory for grafts. Although none have blown out or ruptured at the suture line, they do thrombose. Thrombosis may be due to degeneration of the intima, producing a mechanically rough surface and probably liberating tissue extracts that promote clotting. In longer stored frozen and formaldehyde fixed grafts the intima is probably rapidly fixed and may remain mechanically smooth, without destruction of its tissue cells, and thus does not cause thrombosis. In experimental grafting in dogs, the thoracic aorta was used as a site of grafting in spite of the more hazardous operative risk because thrombosis and other failures were usually sooner manifested by death or other severe complications. In the abdominal aorta the graft would usually be placed distal to the renal arteries, and thrombosis in some instances may not be evident unless visualized by aortography. In dogs the abdominal aorta is smaller than the thoracic and thrombosis occurs more easily, but even here the hydrostatic pressure and rate of blood flow probably discourages thrombosis. In this respect the frozen graft has a definite advantage in that longer stored grafts may be utilized.

The nutrient medium method may have an advantage in that some of the basic histologic structure of the graft and even some of the smooth muscle fibers may be preserved in vessels stored only a short time, up to 40

5. Hufnagel, C. A.: Personal communication to the authors.

6. Deterling, R. A., Jr.; Coleman, C. C., Jr., and Parshley, M.: A Preliminary Report on Experimental Studies of the Frozen Homologous Aortic Grafts, New York Med. **6**: 19 (July 5) 1950. Deterling, R. A., Jr.; Coleman, C. C., Jr., and Parshley, M.: Experimental Studies of the Frozen Homologous Aortic Grafts, to be published.

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days.[7] Therefore the graft may be stronger and may have more basic physiological potentialities, especially if used relatively soon. This may be important in preventing delayed complications such as thrombosis or aneurysm formation after a few years of graft service.

In both methods sterility in the whole bank procedure is extremely important in grafts which are to be used for human patients. Regardless of the ultimate storage method used, a safe and efficient bank can exist only if careful attention is given to each minute detail of asepsis.

USE OF GRAFTS

To date human tissue from this bank has been used with success in accord with certain principles that should govern their use. Satisfactory vascular grafts are difficult to obtain and require a great deal of work in their procurement and storage. They should be used by a qualified, trained vascular surgeon in order to avoid poor results. The New York Society for Cardio-Vascular Surgery, which has established the present bank with a fund donated by the New York Heart Association, realizes that careful supervision is necessary to assure proper use of the grafts and at the same time safeguard the patient. They also realize that extreme care and caution must be exercised in the preparation and the use of these grafts in order not to jeopardize a promising new field of surgery.

SUMMARY

The purpose of this paper is to present a few of the problems of establishing a blood vessel bank, to encourage autopsy permission for donor graft material and to stress some of the simplifications of procedure that not only greatly facilitate the preparation of storage solution but also reduce considerably the chances of contamination. Simplification by Seitz filtration with elimination of autoclaving solutions, attempting to maintain chemical composition, isotonicity and electrolytic balance of the storage solution, is very important if the nutrient medium method is to receive a fair trial and evaluation.

7. Swan, H.; Robertson, H. T., and Johnson, M. E.: Arterial Homografts: The Fate of Preserved Aortic Grafts in the Dog, Surg., Gynec. & Obst. 90: 568 (May) 1950.

Prognosis in Bundle Branch Block.—The average survival time for the 281 patients with right bundle branch block was 3.9 years and for the 555 patients with left bundle branch block 3.3 years. The 185 patients with right bundle branch block who survived the first year of follow-up had an average survival time of 5.7 years, and the 356 patients with left bundle branch block who survived the first year had an average survival time of 4.9 years. From these figures it would appear that right bundle branch block shows a slightly better prognosis than left bundle branch block; however, an analysis of the survival time of different age groups indicates that in patients over the age of 50 years there is only slight difference between the average survival periods of right and left bundle branch block either in the total number of patients or in the group who survived the first year. Below the age of 50 years, right bundle branch block has the longer survival period except in patients between the ages of 30 and 40 years, and this occurs in spite of a high proportion of females to males in this age group.—Col. Richard P. Johnson, Addison Lee Messer, M.D., Shreenivas, M.D. (India), and Paul D. White, M.D., *American Heart Journal*, February 1951.

CONCEPT OF "ACCEPTANCE" IN PHYSICAL REHABILITATION

Morris Grayson, M.D., New York

"Acceptance" is a term variously applied and of essential significance in rehabilitation of the physically disabled. The term is loosely used in rehabilitation circles and is usually understood by implication rather than by definition. Webster [1] defines acceptance as "the act of receiving (a thing offered) with a consenting mind" or "the act of receiving or admitting and agreeing to." By its definition, the word implies an active and very individual process of "agreeing to" or having a "consenting mind." Translated into symptomatology commonly encountered in physical rehabilitation, the term is usually applied to three aspects of the subject's rehabilitation: physical, social and psychological. Physically, acceptance implies that the patient is well aware of the nature of the disability, its origins, its complications and its prognosis. Socially, it implies that the patient is realistic toward his job, toward housing, toward family and other relations. Psychologically, it implies that the patient is showing no serious emotional symptoms referable to his disability.

It is the purpose of this paper to emphasize and elucidate the psychodynamic aspects of the concept of acceptance as it is applied to physical rehabilitation. Acceptance as it is commonly seen appears to be only a symptom but is in reality part of a greater complex that is within the realm of the total personality of the individual. The psychodynamic significance of acceptance is unfortunately too often abbreviated. Expressions such as "willingness to be rehabilitated" or "cooperativeness," while expressing in part the symptomatology of acceptance, do not give the real picture or cast any light on the psychological problem that any disabled person faces.

Consider, for example, incontinence in the paraplegic. Such a symptom definitely has a physical, psychological and social component. The patient cannot control his urine and feces because of the severance of the nervous control (physical); the patient may use this symptom as a means of expressing his hostility toward the environment or as a means of accentuating his dependent needs (psychological); the patient may refuse to leave his wheel chair because of the fear of voiding and being seen or smelled by the people around him (social). Thus, to think of incontinence as a purely physical symptom is to ignore reality. Psychological and social pressures persist in the urogenital area whether the cord is severed or not. Finding the physical reason for a symptom does not exclude the psychological and

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This paper is one in a series of papers to be published by a research team consisting of a psychiatrist, a psychologist and a psychiatric social worker (Morris Grayson, M.D., Joseph Levi, Ph.D., Ann Powers, M.S.) who are engaged in a study of psychiatric factors in rehabilitation. This study is financed by the Commonwealth Fund under the auspices of the Department of Physical Medicine and Rehabilitation and the Department of Psychiatry of New York University-Bellevue Medical Center.

1. Webster's Collegiate Dictionary, ed. 5, Springfield, Mass., G. & C. Merriam Co., 1936.

social components. The same approach to other physical symptoms must be used if one is really to understand what is going on in the patient.

While isolating these various components of a disability may prove a laborious task, an effort has to be made in that direction. Without such isolation, understanding of the disability will be meaningless. The experience of workers in the field of rehabilitation has been just that. While physical methods alone may prove effective, rehabilitation has to consider the psychosocial elements in order to prove effective.

The process of isolating the many components of a physical disability requires first of all a thorough study of the total individual. The patient has to be known to the examiner. He must be known in the true sense of the word—not just as a man with paralyzed legs or a deformed hand or an ataxic gait or a lung with a cavity in it. The patient must be known as a human being who has fears, loves, hates and grievances. His family setting must be known, his whole background, his striving, his petty fears, his pet peeves, the apartment in which he lives, as well as the whole family constellation.

Apart from the superficial psychosocioeconomic factors that appear to play a part in this patient's life, deeper insight must be obtained. Working with more than 100 handicapped patients over the past two years, my associates and I found that there are many deeply rooted factors that play a role in the patient's acceptance of a disability. These factors may be considered to be in two categories: (1) those factors that are of a purely individual nature and concern essentially the personality structure of the individual and (2) those factors that society enforces on the individual because of his disability. A separation of these categories may appear arbitrary, but a careful psychiatric study will frequently distinguish between problems arising in the individual and those imposed by society.

The personality structure of the individual plays an important role in rehabilitation and in the acceptance of the disability. Even a superficial examination of a disabled person will reveal that his reactions to the disability do not stem from the type of disability. We could find, for example, no conclusive evidence of a paraplegic type, a hemiplegic type, a tuberculous type, a multiple sclerotic type or even a parkinsonian type.[2] While paraplegics may resemble one another in certain physical reactions and occasionally in certain emotional reactions, their premorbid personalities appear to form the most dynamic underlying structure of their present psychological behavior.

THE BODY IMAGE IN ACCEPTANCE

The disabled patient as he presents himself to the psychiatrist for help shows evidence of pressure from two directions. One is the reality pressure from outside, which includes society's attitude toward disablement and his family pressures, social, economic and vocational. The other is the internal pressure, which centers around the physical disability in an attempt to find a place for the disability in the body image.

The "body image" is a term used by the late Dr. Paul Schilder [3] to express the picture each person has of himself and of his own body. The body image forms part of every person's psychobiologic constitution. When a disease occurs, particularly one that is physically disabling, the body image has to take on a new alinement. The image has to be reorganized so that the deformed member, the absent member or the useless member of the body can somehow fit into the individual's image of himself. The body image, having been unconsciously formed in childhood, carries with it investments of emotional energy born of many psychological pressures. Parental attitudes toward the child's body, toward urinary function, toward the sexual function, toward aggression and hostility expressed through the functioning body, toward the mouth, the anus and the genitalia are all incorporated to endow the body image and its motor powers with emotional substance.

In working with disabled persons one is frequently impressed, not with their depression, as one would imagine, but more with their complete inability to understand what the disability is all about. The most intelligent persons, even those who have had medical training, frequently are genuinely puzzled as to what the disability means to them. There is a veritable struggle that takes place. As one patient aptly put it: "There is no rhyme or reason why I should be a paraplegic. I can't connect it with anything I know. It just has no sense." Such inability to understand does not depend on the intellectual status of the patient. Although information may be given them as to the exact nature of their organic condition, patients still persist in going from physician to physician, professing ignorance as to the meaning of their disability. Physicians frequently find that persons with long-standing paraplegia appear to have no information at all as to the prognosis of the paralysis. We have found that these persons have certainly been told about the prognosis, but it is meaningless to them because they cannot find any place in their body image for the deformity. From this difficulty ensues symptomatology that interferes radically with rehabilitation. Patients will deny the deformity. There may be feelings of unreality and depersonalization. There will be marked resistance to the use of braces and crutches. There may be very unrealistic plans for a future vocation. Frequently poorly localized pain may attest to the patient's rejection of his disability. This symptomatology is essentially a defense which the ego unconsciously sets up to maintain its integrity in the face of the body image disturbance. The struggle is a painful one and, above all, is of an individual nature.

However, the disability is not always a strange phenomenon in the *Gestalt* of the patient. Some think of it as God's will and accept it as such; some feel that it represents a punishment for earlier transgressions, while others show evidence of conscious and unconscious guilt feelings that are assuaged by the disability. In other patients the acceptance is so complete that only a psychoanalytic study will give a clue as to the place that

2. Bellak, L.: Psychiatric Aspects of Tuberculosis, Social Casework, May 1950, vol. 31, no. 5. Barker, Wright and Gonick: Adjustment to Physical Handicap and Illness: A Survey of the Social Psychology of Physique and Disability, Bulletin 55, Social Science Research Council, 1946.

3. Schilder, P.: Image and Appearance of the Human Body, London, George Routledge and Kegan Paul, 1935.

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the disability fits into. If the body image is thought of as a jigsaw puzzle and the disability as a grossly deformed part of the puzzle, a better idea of the problem of trying to fit a disability into the body image will result. The human being unconsciously shuffles the puzzle around and around in an effort to fit the deformation into a reconstructed jigsaw. The original jigsaw consists of the physical being, its many sensations, its many perceptions and its libidinal investment. The physical being cannot be shifted around, but the libidinal investment can; it is thus that internal acceptance can be accomplished.

REPORT OF CASES

A 58 year old man, formerly an active wholesale butcher, sustained a left hemiplegia following a cerebrovascular accident. He was admitted to the Institute of Physical Medicine and Rehabilitation one year after the accident. His wife complained that there was just no living with him since the accident. He was most demanding of her and everybody around him. She had to attend to the minutest detail of his dress and toilet. Here at the Institute he protested vigorously that he was being "shoved around"; that there was a certain amount of "regimentation" at the Institute, that all his life he had been the boss and he was not going to take instructions from "some sergeant". His program suffered because of his attitude.

The staff worked with this patient, and the inconsistency of his pronounced physical dependency as opposed to his aggressive verbalizations of independence was pointed out to him. It was at this point that he told us that he just couldn't accept his being disabled. Disability had only one meaning for him. It meant that he had to be taken care of as he had taken care of others.

Study of the patient's history revealed that he had been the supporter of his family and siblings at a very early age, that he subsequently became a successful and aggressive meat dealer and devoted a good deal of his energies and money to the organization of aid for disabled persons, particularly blind children. Throughout his interviews, he made it clear that he wanted to be treated as he had treated other disabled individuals.

Essentially, this patient's whole life had been a reaction against his basic dependent needs. Disability had meant for him a means of being taken care of as a dependent child, and he was overreacting to this need in the form of hostilities, aggressiveness and apparently irrational attitudes toward his wife, the staff and his disability.

Disability had a clearer meaning for this man after psychotherapy, with the result that incorporation was an easier task and not only did his attitudes change but his rehabilitation progressed rapidly.

In other cases the acceptance is so complete that one may actually become skeptical and suspicious. In cases in this category the patients actually carry with them the suspicion of hysteria and sometimes malingering. The disability appears to come at just the right time and the right place. I shall cite briefly one case which would be best understood by greater detail but which can only be highlighted in this paper.

A 36 year old white man was admitted to our rehabilitation ward three weeks after the diagnosis of postpoliomyelitic paraplegia had been made by competent authorities. The patient complained of many physical symptoms in relation to all the organs of his body except his legs. He resisted all ambulatory exercises on the basis of physical complaints unrelated to his paraplegia. He complained of suffocation, of sore throats, of abdominal distress. He wanted to know what positive measures had been taken to rule out cancer, tuberculosis and syphilis. The lack of concern about his inability to walk was conspicuous.

Psychiatric study of this patient revealed that the poliomyelitis had come immediately after he had obtained an executive position that he did not want. This patient always had wanted to be a writer. He had been discharged from one executive position two days previous to his having obtained this new job. He had wanted neither one of them. At the same time, he was having a great deal of marital difficulty, his wife having threatened to leave him shortly before his illness.

Intensive study revealed marked infantile anxiety in relation to separation from his mother (who had died a few years previously). He tried unconsciously to make a mother substitute of his wife, with consequent rebellion on her part. How the poliomyelitis struck and the propitious time that it did strike is open to speculation. It is not a question that can be readily answered, but it is known that the paraplegia fitted into a psychological scheme that was accepted by the patient. When the acute anxiety over other bodily symptoms was worked with and alleviated, he was capable of applying himself to ambulation and with only some help from us, he went about the business of getting a job and reestablishing himself in his home. This patient seemed to know just what he was about, and he handled his physical disability as though it had always been a part of his life.

SOCIAL INTEGRATION (THE REALITY PRINCIPLE)

Once inner acceptance is obtained, social integration is the next step. As has been pointed out, society is definitely disoriented and disorganized as concerns disability, but the disabled person has to integrate himself into society whether it is disorganized or not. It is the physician's task to mobilize all members of the team so that the maximum is obtained not only from the patient but from society as well. One cannot speak of real acceptance unless the patient is capable of integrating himself into society, whether society's reaction to him is psychopathological or not.

All workers in rehabilitation are familiar with the many social obstacles that a disabled person has to hurdle in order to effect rehabilitation. While psychological or inner acceptance may take place, society as a whole presents realistic problems that may continually disturb the inner configurations of the individual. When a patient with a deformed arm states that "people look at me," such a feeling may be based on the importance to the patient of being seen as well as on the realistic aspect of actually being looked at. When a paraplegic girl complains that "nobody will want to marry a paraplegic," she is expressing, first, her inner feelings about marriage and, second, the realistic fact that many men (not all men) would be disturbed by a marriage to a paraplegic girl. When a disabled person complains that he cannot get a job because people don't hire disabled people, he expresses not only his own attitudes toward working but also the realistic fact that employers do hesitate to hire disabled persons.

The above are only three brief examples of presenting obstacles that are classified in the realm of realistic social problems but that in reality carry with them individual needs. There are many more. Society on the whole does react to disability to the detriment of the rehabilitation of the disabled person. Many studies have been made on the problem of society's acceptance of the disabled.[4] For the most part, these studies have come

4. LaDieu, Adler and Dembo: Social Acceptance of the Injured. J. Social Issues 4: 55-61, 1948.

to conclusions that involve the misconceptions of the individual as well as the misconceptions of society. Individual psychology plays the principal role.

Although statistics show that if the disabled person is well placed he can produce as well as the nondisabled, employers still resist tenaciously the placement of the disabled. It is not the purpose of this paper to analyze society's reaction to the disabled.[5] Suffice to say that those dealing with disabled persons react to disability on a very personal conscious and unconscious level. Employers are apt to see the disability rather than the ability. The same holds true for professional personnel as well. Deformity sets up a train of reactions in the onlooker, as it does in the patient himself, so that most decisions as to employment or unemployment rest on the psychology of the employer and only secondarily on economic considerations.

Workers in the field of rehabilitation are frequently overwhelmed by the numerous social problems presented by the disabled person. Society's reaction to disability is a realistic problem, but it should not be frustrating. When it is recognized that acceptance is a twofold process involving not only society but the patient's inner struggle and his own individual psychology, the task becomes an easier one.

THE ROLE OF A PSYCHIATRIC TEAM IN ACCEPTANCE AND REHABILITATION

The burden of rehabilitation must be shared by the physician and the patient alike. Although acceptance and consequent rehabilitation can be effected by the patient himself without recourse to an organized rehabilitation center, such a center can aid considerably in the patient's acceptance of a disability. Aid can come not only from the physical means employed but from the psychological attitudes employed. Psychological help based on a knowledge of the patient's social and psychological needs will do much toward advancing acceptance of the disability. The program must be based on a knowledge of the two basic aspects of acceptance: (1) the need for psychobiologic incorporation (the body image) and (2) social integration (the reality principle).

A center of rehabilitation should not be a mechanized organization of expensive and ingenious physical agents but should recognize the value of the interpersonal relationships. The staff to a great extent represents the people whom the disabled person will encounter on the outside. Patients are ever conscious of attitudes of the staff. They look for social acceptance, or they use individual staff attitudes to prove that they really are not accepted. Essentially, patients ask for ways and means of understanding their disabilities in terms of themselves and in terms of society. The need rarely takes the form of overt questions but may show itself by positive as well as negative attitudes toward the staff. The patient uses an unconscious testing process, which may manifest itself from the extreme of marked affection and dependence to hostility and negativism. The pattern that is used is based on the individual psychology of the patient and not on the character of his disability. Thus, a staff that is indoctrinated in individual physical needs should be just as aware of psychological needs and recognize the part they play in the acceptance of the disability.

A psychiatric team can do much toward aiding a patient to accept his disability. By careful social service study, then by psychological testing and finally by psychiatric study, the patient becomes "known" to the team. The complex of conscious and unconscious factors that form the configuration of the patient's image of himself becomes clearer and clearer. It is only then that the psychiatric team can aid the patient not only directly by psychotherapy but indirectly through the staff of physical therapists, occupational therapists, nurses, orthopedists and others.

Psychotherapy is directed toward the meaning to the patient of the disability. It is a form of an educational process that deals with the emotions in regard to the disability rather than with the disability itself. This meaning is vested in the past emotional experience of the patient, and psychotherapy aims at aiding the patient in the realinement of the image of himself.

In psychotherapy emotional resources are explored, just as physical abilities are explored in physical medicine. In the physical aspects of rehabilitation a great deal of attention is focused on a chart of details known as "activities of daily living," devised by Deaver.[6] The same attention to details has to be devoted to the psychological aspects of the patient's life before any therapy can be instituted. The patient's basic psychological resources must be known. Obstacles to the effective utilization of the resources are studied and explored with the patient, and the patient is aided in the hurdling or dissolution of these obstacles. These obstacles are qualitatively and quantitatively defined by the individual.

Psychotherapy, as rehabilitation itself, is most effective on an individual basis. Mass approach to the problems may be effective in some cases, but the disabled person wants to be considered as an individual. Since the concept of acceptance is based on individual needs —his own image of himself—mass approach to disability will be relatively ineffectual.

CONCLUSIONS

1. Acceptance is the psychological key to physical rehabilitation.

2. The psychodynamics of acceptance involve two processes: (*a*) psychobiologic incorporation (the body image) and (*b*) social integration (the reality principle).

3. Acceptance and rehabilitation can take place without a physician's aid, but in many cases a center of rehabilitation is necessary.

4. A psychiatric team functions directly by psychotherapy to the patient and indirectly by education of other workers in the rehabilitation team to the individual psychological needs of the patient.

5. Menninger, W. C.: Emotional Adjustments of the Handicapped, read before the National Society for Crippled Children and Adults, New York, Nov. 7-10, 1949.

6. Deaver, G. G., and Brown, M. E.: Physical Demands of Daily Life, in Studies in Rehabilitation, no. 1, New York, Institute of Crippled and Disabled, 1945.

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COUNCIL ON NATIONAL EMERGENCY MEDICAL SERVICE

CIVIL DEFENSE ORGANIZATION AND MEDICAL AND HEALTH SERVICES IN CIVIL DEFENSE

James C. Sargent, M.D., Milwaukee

The two following papers are part of a series requested by the Council on National Emergency Medical Service to inform the medical profession on problems pertaining to civil defense. They do not necessarily reflect, however, the opinions of the Council or of any other official body unless so stated in the article.

In World War II, the United States was able to marshal its strength and equip its armies while protected by redoubts that are no longer effective. Without warning, the modern bomber and the fifth columist may now strike devastating blows that could destroy our potential capacity to strike back. Our factories and farms, our railroads and mines could be rendered powerless to forge the mighty machine that would be needed to retaliate in kind on the homeland of the enemy.

Our armed forces would prevent much of this destruction, to be sure. Complete military defense is impossible, however, and a paralyzing blow could be dealt our military potential. We, as civilians, can prevent this paralysis. Indeed, we must, for it is our responsibility and ours alone. Not only our industrial capacity and innumerable lives but the actual success of our military operations will depend on the adequacy of our civil defense preparations. Civil defense stands alongside military defense as a vital component of our national security. This responsibility for national survival now rests on every citizen. The choice is now ours, and not that of the military alone, as to whether we will survive as a free nation.

Civil defense must not be allowed to sap the energies of the military whose every effort must be directed toward destroying the enemy. Civil defense must depend on civilians, who under civil authority must prepare for and by their own efforts mitigate the effects of enemy action on themselves, so that they may continue the activities without which war cannot be won.

The critical value of peacetime civil defense preparations was conclusively proved in the great testing grounds of the last war. The British, with their years of preparation, were able to withstand the power of the Luftwaffe. The Germans, with few prior preparations because of a serene sense of security, were rendered powerless to combat the effects of the allied attacks.

CIVIL DEFENSE ORGANIZATION

Since the object of civil defense is the survival of the nation as a whole, its success will depend on two principles, self help and mutual assistance, which must be applied successively from the lowest unit, the individual, up through the family, neighborhood, city, state, and region to the nation itself. Each must care for its own needs whenever possible, but assistance must be provided whenever needed. It would be economically impossible and militarily disastrous for every potential target area to be made self sufficient for its own protection. The necessary assistance must be provided by the surrounding communities. This same principle must apply to the persons within a family, to the families within a neighborhood, to the neighborhood within a community, to the communities within a state and to the states within the nation.

The responsibilities of surrounding communities will consist of far more than the dispatch of assistance to the target areas so that their inhabitants may survive. The children, expectant mothers and the aged and infirm, as well as the casualties of the enemy's attacks, must all be provided with shelter and care by those more fortunate. This duty to those who must remain at their tasks amidst the hell of the bombs must be met with foresight and the general realization that all are responsible for the survival of the nation.

The system of United States civil defense follows naturally from our traditions and our form of government. The basic responsibility lies with the individual and his local government. The family, as a unit, does what it can for itself and for the community. Each community cares for itself. It receives assistance from others if this is needed or contributes help to neighboring communities if this should be required. The community is assisted by the state and federal governments wherever and whenever assistance is needed.

Because of their inherent powers and responsibilities, the individual states provide supervision and leadership within their borders during all phases of civil defense planning and, along with the federal government, contribute the organizational and training advice and the material assistance that is needed. They would direct the intrastate supporting elements in the event of an emergency. The federal government provides a national plan and policy, training and facilities and coordinates interstate operations. It will furnish the states and communities with some of the necessary equipment and will advise them concerning the stockpiling of medical and other supplies that will be needed at a time of disaster. The federal Civil Defense Administration is responsible for the coordination of all civil defense planning and the transmittal of civil defense plans, programs, advice and assistance to the state governments.

The governor is responsible for the civil defense program of each state. A state civil defense director is usually appointed; he acts for the governor, directs the civil defense operations of the state and coordinates them with the civil defense activities of other states and the federal government. The governments of local communities are responsible for establishing and administering their own civil defense organizations,

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under the guidance of the state civil defense director or his deputies. A local civil defense director is usually appointed to act for the mayor or comparable official in this regard. Both state and local civil defense organizations must of necessity be built around existing agencies of government, and only those new civil defense services that have no existing counterparts should be added.

An effective civil defense program, whether at the national, state or community level, will require legislation. A federal law was needed for the establishment of a federal civil defense agency and the allocation of its necessary functions and powers. State legislation is necessary for the establishment of state civil defense agencies and should give the governor adequate emergency powers to deal with wartime disasters from any cause. These powers would also be helpful in dealing with peacetime disasters such as fires, floods, hurricanes and earthquakes. The civil defense legislation of the local communities will be patterned after the legislation of the states and will make provision by local ordinance for the powers conferred by the state legislation to the extent that is required by the laws of the state.

Civil defense has been defined as the "protection of the home front by civilians acting under civil authority to minimize casualties and war damage and preserve maximum civilian support of the war effort."

The civil defense measures that must be taken fall roughly into four main groups. The first comprises measures by which civilians may work with the armed forces in order to avert an enemy attack, such as aircraft observer and warning systems, camouflage and blackouts. The second comprises the measures that are taken in advance so that the effects of enemy action will be minimized, such as the dispersion of important facilities, the evacuation to a safer location of children and others who are not essential to the war effort, the construction of air raid shelters, the education and training of the populace in protective measures and civil air raid warning systems and signals. The third comprises all those measures that would be needed to alleviate suffering and to mitigate, control and repair the actual damages resulting from enemy attack. These would include the medical and health services, as well as the rescue, welfare, fire, police, communication, decontamination services and many others. The fourth group, which bears an intimate relationship to each of the others, consists of such measures as civil defense legislation, policy, organization, training and research and development.

Modern war is total war, which means that a nation's civilian population may experience enemy attack to the same extent as its armed forces. It would be an obvious advantage to an enemy to destroy our industrial capacity. It would be of equal advantage to him if he were able to destroy the willingness of our people to withstand his attacks. It would be impossible to overestimate the importance of the civil defense medical and health services to the nation's survival in this regard. The sick must be cared for; enormous numbers of casualties must be treated, and all must be protected from the communicable diseases that could accompany the disruption of normal public health and sanitary safeguards.

Plans must be made in peacetime, since the opportunity for careful preparation and organization is irrevocably lost during the confusion and urgency that is attendant on war. All trained health personnel, including dentists, nurses, veterinarians, pharmacists, sanitary engineers, technicians of all types, as well as physicians, must participate and must cooperate wholeheartedly and unselfishly with each other and with those in authority.

MEDICAL AND HEALTH ASPECTS

As with other aspects of civil defense organization, the creation of new and overlapping civil defense medical and health agencies is avoided by the delegation of responsibility to existing state and local health agencies and personnel who would function in wartime under civil defense regulations. Civil defense medical advisory committees at both state and local levels, composed of representatives of the various health professions, will be of immeasurable assistance to those in authority during all stages of the planning, organization and operation of the civil defense medical and health services program. These advisory committees should be differentiated from the civil defense advisory councils, which are appointed to advise and assist the state and local civil defense directors and which are composed of representatives of each of the civil defense services, including the medical.

The provision of emergency casualty care will entail an enormous amount of thought and ingenuity. Every step in the process must be carefully planned and organized, from the initial first aid treatment to the final discharge from hospital. This service must be available not only to the local community but to other communities that may need assistance. Preparations must be made with the realization that many professionally trained persons will be unavailable to civil defense because of service with the armed forces. Many others in an area struck by severe disaster will themselves be casualties.

First aid stations must be established where emergency lifesaving measures may be initiated by the physicians, dentists, nurses, pharmacists, first aid workers and others who will be assigned to them. The necessary emergency supplies and equipment must be stockpiled and stored in areas from which they may be readily transported to the station sites.

Emergency hospitals will be required, where more definitive treatment can be given than would be possible in the first aid stations. These would be of three main types: improvised hospitals, which would utilize buildings such as schools, which can be converted to emergency hospital use; those hospitals in the community that remain undamaged, and hospitals in adjacent communities or even in adjacent or distant states.

Surgical teams, composed of surgeons, nurses and anesthetists, will be required for service in the local community and to render assistance to other communi-

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ties. Similarly, the services of surgical and dental specialists, as well as shock and burn teams, must be readily available to assist wherever needed.

Medical planning must also consider those who were seriously ill before and to whom care must be rendered after a wartime disaster. In addition, there must be provisions for not only obstetric, pediatric and psychiatric care and the emergency medical and surgical procedures that are normally required but for the additional burdens that may be placed on each of these services by the extreme physical and emotional impact of a disaster.

The fact that certain animal diseases can be transmitted to man either directly, through insect vectors, or through the consumption of infected meat or animal products stresses the crucial importance of the veterinarian to the civil defense program. The hazards that could follow disruption of the normal system of food inspection, controls, storage and transportation, entirely apart from the fact that the meat or milk supply might be endangered by the possibilities inherent in biologic warfare, might overtax the resources of the medical and health services if suitable provisions are not made in the civil defense plans.

Medical and surgical supplies and equipment must be stored and plans must be made for their distribution to areas where they will be needed, or much of the other medical planning will be wasted. It has been recommended that hospitals increase their current stocks of supplies. It would be inordinately expensive, however, and would require excessive duplication of critical materials if there were to be local storage of adequate supplies to treat the enormous number of casualties that could result from a major atomic attack on each of our large metropolitan areas. It is expected that these items will be stockpiled by the federal government in locations where they will be accessible to more than one area when needed.

The tremendous quantities of whole blood and blood derivatives that may be required must be where they are needed at the time they are needed. The logistical problems involved are extraordinarily complex and may be solved only by the cooperation of the many agencies concerned. The American National Red Cross has been assigned the major responsibility for the national coordination of the procurement, storage and processing of blood in an emergency. The success of this program will require the cooperation and participation of the non-Red Cross blood banks and programs and the establishment of blood banks in communities that do not possess them at present.

Effective public health services in target areas are essential. The appearance of mass pestilence may only be prevented by the most careful planning and complete preparation by the civil defense health services, as well as by the thorough indoctrination of every member of the population in the absolute necessity for proper sanitary discipline.

A wartime disaster may carry in its wake the diseases that scourged mankind before their control was established. Without sound preparations, drinking water may remain contaminated and sewage disposal left to chance; the insect and rodent vectors of disease may be enabled to spread unchecked; emergency kitchens may be permitted to serve contaminated food and drink. These adverse effects would be greatly enhanced by the concomitant dispersion of whole populations. A disregard of these preparations may well lead to what will prove to be the biologic warfare of World War III.

The machines of war are produced and fed by our industries, which are dependent, in turn, on the physical and mental health of their employees. Industrial medicine and hygiene would play a dominant role in our success during any future war, especially since the battle of the production lines would then bear a new and terrible connotation.

The civil defense medical and health services must prepare in advance an efficient system of emergency mortuary services. The bodies of the dead must be recovered, identified if possible and buried with all the aherence to religious tenets that is practicable under the circumstances. This is necessary not only for the maintenance of vital statistics and the preservation of morale but also for health protection of the survivors. Accurate records must also be maintained of the ill and the injured and of those who are evacuated to hospitals in other areas. In this way families may be reunited, and insurance and similar records may be maintained.

NEWER WEAPONS AND MORALE FACTOR

There are numerous responsibilities that devolve on the members of the health professions because of the possibilities inherent in the enemy's use of the newer weapons of warfare. The detection of atomic, biologic or chemical warfare agents, as well as the treatment of casualties from their effects, entails specialized knowledge and facilities that should be supervised, for the most part, by the health professions. The National Security Resources Board has, therefore, recommended that the responsibility for planning and organizing state and local civil defense measures against these special weapons should be assigned to the civil defense medical and health services, but with the participation of other civil defense services where their responsibilities and functions are involved.

Monitoring services for the detection of all three types of agents must be organized and trained. Protective and decontamination measures must be planned and provided. The members of the health professions must become familiar with the clinical effects of these agents on humans and animals, and they must be prepared to treat them not only correctly, but in numbers that would preclude treatment were it not for careful and thorough preparations.

The responsibility for learning the effects of these weapons and the correct treatment procedures for the resultant casualties does not rest alone with those who practice in or near the potential target areas. Nowhere does the responsibility for the mutual assistance aspects of civil defense fall more heavily than on the members

of the health professions. Those whose homes are in areas not even remotely considered liable to attack must be prepared to treat casualties evacuated from the disaster areas and must be prepared to move to the scenes of disaster where their services would be needed, even were it not for the fact that majority of the health personnel who lived in the disaster areas would be among the casualties.

There is one aspect of modern warfare that is usually not considered, and yet its effects may lose a war before a bomb has been dropped or a shot has been fired. It is one that the health professions, by the very nature of their relations with the lay population, can influence decidedly for the better. This is psychological warfare. And a nation may wage it on itself. The nebulous quantity that is defined incompletely as morale, which is evidenced by the willingness of a people to endure and to withstand an enemy's attack and to continue to fight back, would be as much a target as would our great production centers. This attack need not come by means of aircraft alone. There are more subtle means by which its effects may be accomplished, well in advance of actual hostilities. Born of ignorance and nourished by misconceptions, the effects of this form of attack are an apathy and defeatism that would preclude success in modern war.

The people of this nation must learn to live with rather than in fear of the atomic bomb, for its threat will remain with them for a considerable time to come. The public must be educated with respect to the true potentials and limitations of atomic warfare. Never before has there existed a weapon that permits such an opportunity for exploiting the people's fear of the unknown. The same might be said of biologic and chemical warfare agents. This is not intended to disparage the effects of these weapons, for their use could cause untold thousands of casualties. But there is nothing new or mysterious in the effects of these weapons. Burns, fractures and lacerations make up the majority of their effects. The radiation that is so dreaded causes only a small percentage of the casualties and has been used daily as a diagnostic and therapeutic aid for many years. In addition, this radiation is but a by-product of a weapon that depends for its effects chiefly on blast.

The diagnosis and treatment of the biologic warfare agents may be found in any good textbook of medicine. The actions of and the antidotes for the chemical warfare agents may be found in any good textbook of pharmacology. Once again, the problem that confronts the health professions lies not in any lack of knowledge concerning these agents but in the lack of suitable plans and programs for handling large numbers of casualties from them. The members of the health professions have a clearly delineated responsibility to their patients and to the nation to familiarize themselves, as well as their patients and others with whom they come into contact, with the true potentials and actual limitations of these warfare agents.

324 E. Wisconsin Avenue.

MEDICAL ASPECTS OF CIVIL DEFENSE IN BIOLOGIC WARFARE

Victor H. Haas, M.D., Bethesda, Md.

The concept of biologic warfare is not new. Perhaps ever since man has known that microorganisms cause disease, there has been speculation as to the possibilities of their intentional use to harm an enemy. Writers of fiction and journalists have theorized on the subject, usually without attention to the limitations of fact. Infectious agents have been employed in a few instances to commit murders, but their intentional use against numbers of persons simultaneously has not been accomplished. There are incomplete accounts of what may conceivably have been rather crude approaches to such actions in past wars, but these are of no significance in this report. It is possible that biologic warfare may never be employed, just as chemical agents were not used in World War II. Deterrent factors would include fear of reprisals, force of world opinion and perhaps apprehension that some agents might redound to injure the user, just as chemical agents did in World War I. Still, plans for defense must take into account all the conceivable capabilities of a potential enemy, including biologic warfare.

Control of naturally occurring communicable diseases begins and ends with the practicing physician. He makes the initial diagnosis, recognizes the extent of communicability, makes the necessary reports to the health authorities, sees that proper measures are instituted to limit spread of contagion (where this is a factor) and treats the patient. If immunizations are to be done, he does them. Plans for civil defense against biologic warfare must be based on the procedures which are known to be effective against infectious diseases of natural origin. It is obvious that the practicing physician must have a key role in such plans and in subsequent operations, should the threat ever materialize.

THE PROBLEM

Definition.—Biologic warfare, also known as bacteriologic warfare, is the intentional dissemination of microorganisms or their products for the purpose of producing casualties among target personnel or injuring or destroying important animals or crops. This paper deals only with biologic warfare against humans.

Enemy Objectives.—The agents of biologic warfare could be directed against a target population by a potential enemy in order to achieve one or more of several objectives. Prior to acts of open warfare, one objective might be to interfere with mobilization and to reduce the effectiveness of reaction to a subsequent overt attack. In this instance, selected targets of a limited nature could be anticipated. Key persons in high military or civilian positions, strategic military installations or critical utility centers might be chosen for attack. An-

This is not an official statement of any agency of the federal government.

Director, National Microbiological Institute of the National Institutes of Health, Public Health Service, Federal Security Agency.

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other objective might be the reduction of the ability or the will to carry on hostilities during a full scale war. Large scale attacks might be directed against civilian or military personnel. At the climax of a particularly intensive campaign, in combination with other weapons of warfare, the purpose of the enemy might be to achieve a decisive, prostrating blow. At any time, with or without temporal relation to overt military activity, the motivating factor might be to test the effectiveness of a particular agent or to cause as much trouble as possible. Another object might be to produce casualties which the attacked population would attribute to natural disease outbreaks.

Characteristics of Biologic Warfare Agents.—It may be reasoned that agents capable of being employed for biologic warfare should include these characteristics: Stability to ordinary temperatures is a requirement. For dissemination in the air, stability to drying and sunlight are necessary. The agents to be employed must be suitable for effective dissemination. However, this need not be by natural routes. Animal experiments and laboratory accidents have shown that many organisms can produce disease when introduced through portals of entry other than those involved under natural conditions. For example, the virus of equine encephalomyelitis, transmitted by mosquitoes in nature, has produced disease when accidentally inhaled. Diseases transmitted by unnatural routes may resemble the natural infection, or they may differ in enough characteristics to impede diagnosis. Capability of economical production in quantities adequate to achieve the purpose is an important characteristic. Microorganisms are produced in quantity for a variety of beneficial purposes, e. g., influenza virus for the manufacture of vaccine; fungi for the elaboration of antibiotics; yeast in the brewing process. For limited targets, relatively small quantities of a biologic warfare agent would be sufficient. Absence of odor, taste or color of the aerosol containing the agents is a requirement for the prevention of detection by the physical senses. Agents against which the population attacked has little immunity or no suitable means of control or which are capable of producing diseases for which treatment is difficult or inadequate would be particularly suitable.

A variety of pathogenic agents have enough of the attributes listed to merit serious consideration as possibilities. The following agents might be suitable: viruses, such as those causing influenza and psittacosis; rickettsiae, such as those causing typhus and Q fever; bacteria, such as those causing typhoid and cholera, or those which produce tularemia and plague; fungi, such as Histoplasma capsulatum and Actinomyces; toxins, such as that produced by Clostridium botulinum. A combination of agents might be used and could produce unusual or confusing clinical and laboratory results.

Many agents which cause disease under natural conditions do not meet the essential requirements for effective use in biologic warfare. Many animal parasites, such as the plasmodia, the schistosomes and the filariae, would be unsuitable. All these require intermediate hosts for adequate dissemination, and this introduces a factor not readily susceptible to intentional manipulation. (In some instances, diseases requiring intermediate hosts might be used with certain initial effectiveness, but they would be susceptible to rapid control, e. g., yellow fever.)

Organisms that cannot be produced readily in appreciable quantity, such as the virus of infectious hepatitis, could not be used effectively. Agents that are unstable, such as diphtheria toxin, would also be ineffective.

Routes of Dissemination.—Pathogenic agents are disseminated by nature in a great many ways; they have been disseminated experimentally to animals in even more ways than provided by nature; they have been disseminated accidentally to man by both natural and unnatural routes. For intentional dissemination to man, to produce the maximum effectiveness, it may be reasoned that one of the principal routes would be through the air. This could be done by introduction of agents into air-circulating systems of buildings or by dispersal into the general atmosphere of a target area. Another medium might be the drinking water. The agent could be introduced into storage reservoirs or directly into circulating systems. Intentional contamination of milk and other foods is possible and must be considered as part of the problem, but one might reasonably expect these to be generally less attractive avenues of dissemination than air and water, except under special circumstances. The introduction of a biologic warfare agent into drugs and cosmetics or onto money or papers might also be a method of dissemination.

Primary dissemination might be followed by secondary distribution of an agent. Organisms dispersed into the air would eventually settle onto exterior and interior surfaces. Subsequently, air motion or other surface disturbances could cause dissemination of the organisms back into the air. (This phenomenon is sometimes described as creation of primary and secondary aerosols.) Contaminated water could, in turn, contaminate food supplies, as happens in floods.

Methods of Dissemination.—Biologic warfare would be readily adaptable to sabotage, and it must be assumed that it could also be used as part of conventional warfare. A saboteur need not depend on an outside source of supply for pathogenic material. Many infections or toxigenic microorganisms can be grown in a kitchen; that is where Koch began his experiments in bacteriology. An enemy agent or sympathizer, employed in a laboratory even in a minor capacity or having access to one, could produce surreptitiously adequate quantities of some biologic warfare agents.

Introduction of suitable agents into the air could be accomplished by devious means not readily subject to detection. Employment in a janitorial or maintenance capacity would afford access to air-circulating systems of important buildings; such employment could even be simulated for the brief periods that would be required. For dissemination of agents into the general atmosphere, a wide variety of sprayers ordinarily used in insect control could be adapted. Properly timed and staged, such

dispersal of biologic warfare agents could be carried on without exciting the suspicion even of actual witnesses.

Contamination of drinking water could be attained by introduction of infectious or toxic material into a house or apartment water pipe, with the use of a suitable pump; almost no risk of exposure would be necessary. Many reservoirs are open, inadequately protected and easily susceptible to contamination.

Saboteurs might attempt to take advantage of naturally occurring circumstances, such as floods, earthquakes or smogs, in the hope that disease outbreaks intentionally perpetrated by them, would be mistakenly attributed to the natural events.

Contamination of milk, food and possibly other materials by surreptitious means could be attained by methods that will occur to anyone who considers the possibilities.

As part of actual warfare, it is reasonable to assume that microorganisms or their products could be employed in ways similar to those used in World War I for chemical attacks. Incorporation of suitable biologic agents into munitions would permit their dispersal during the course of artillery or aerial attack and could be expected to give concealment to their actual use. Infectious or toxic material would also appear to be suited to use in booby traps or in a manner similar to the employment of land mines.

Effects.—If biologic warfare either by sabotage or as part of overt military activity were successful, it would produce casualties varying from relatively mild illnesses to death. Probably incapacitating illness rather than extensive fatalities would be the goal of a potential enemy, since this would tax medical, health and economic facilities to a greater degree. Appreciable effects could be attained without making a majority of the target population sick. In many industrial operations, effectiveness falls off sharply if even less than 20 per cent of employees fail to report for work. If selected key persons can be incapacitated, a limited number of casualties might result in a serious damage, at least initially or for some critical period. Whatever the direct damage in terms of sickness, death, decreased efficiency and confusion, there would also be a psychological reaction on the part of the attacked population. Fear of the unusual or the unknown has panic potentialities, and this aspect of the problem would require serious consideration; undoubtedly an enemy would make every effort to exploit it.

Actually, one cannot assess the effects of biologic warfare in terms of direct experience. It has never been used, at least not on any scale that would be of significance in this report. Some persons with medical competence have claimed that biologic warfare will never be a serious threat; others, presumably equally competent, have stated that it is a greater hazard than the atom bomb. Whatever view one takes must be based on judgment rather than demonstration. As a basis for such judgment, there are available a great many reports on epidemiological experiments with animals, a considerable body of experience with accidental infections among human laboratory workers and a broad knowledge of the behavior of infectious diseases under natural conditions.

This experience indicates that conditions which appear to favor the occurrence of human infectious diseases in nature can be simulated artificially. Also pathogenic microorganisms or their products have been disseminated experimentally among animals by methods that could be adapted to human biologic warfare. Finally, laboratory accidents resulting in human infections have occurred under circumstances that could be created intentionally for biologic warfare purposes.

Consideration of these facts justifies the working hypothesis that selected pathogenic agents could be disseminated among human populations in such a way that some of those exposed would become casualties. Diseases resulting from such attacks would probably be entirely similar to those occurring naturally in most instances, but the possibilities of confusion arising from mixed agents or unnatural routes of dissemination must be remembered.

Mitigating Influences.—The extent to which biologic warfare agents would produce sickness or death would be influenced by the same forces which affect natural outbreaks of infectious diseases. Under the assumption that casualties will occur after an attack, there are several factors that would tend to limit either the proportion of exposed persons who might become ill or the possibility of secondary cases developing from exposure to those actually subjected to attack. First, many of the agents that appear best to meet the requirements of biologic warfare do not spread from person to person. Second, in most natural disease outbreaks, there are exposures that fail to result in sickness. Some of these produce subclinical infections, which immunize the exposed person (e. g., diphtheria). Third, most populations have some degree of resistance to a variety of infectious agents. This is hard to measure, but it appears to be a factor in limiting the spread of communicable diseases in nature. Some of this resistance is racial, a striking example being the refractoriness of the Negro to vivax malaria. Some is acquired, either naturally by mild, often unrecognized, infection (as in poliomyelitis) or by artificial immunization (as in smallpox). Fourth, it will be difficult for an enemy to deliver an optimal dose of a given infectious agent to a target population, since optimal doses for deliberate infection of humans under conditions of biologic warfare are not known, and such factors as wind, rain, temperature and convection which would affect dissemination of the selected agent are not subject to control. Finally, adequate preparation in advance and proper reaction after an attack will make possible the application of the methods of communicable disease control which permit limitation of natural outbreaks and which may confidently be expected to achieve control over infectious agents deliberately disseminated.

Assumptions for Defense.—Considering the possibilities of biologic warfare, along with the mitigating influences, it is reasonable for one to base plans and

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operations for civil defense on these assumptions. Biologic warfare can be used against civilian populations. A variety of infectious agents or their products can be disseminated among target personnel, either by sabotage or as part of conventional military action. Also, the effects of successful attacks will be those resulting from nearly simultaneous exposure of a group of persons, large or small, to a common hazard. Primary casualties may be expected in numbers that cannot be accurately predicted. Secondary cases will probably not be numerous and would not need to be considered in many, perhaps in most, attacks. Self-perpetuating epidemics would not be likely (though they could occur, theoretically, under a fortuitous combination of circumstances). Finally, defense measures based on known principles of communicable disease control will make it possible to minimize the effects of attack and perhaps to deny an enemy the attainment of his objectives.

THE DEFENSE

Purpose.—Civil defense against biologic warfare ideally would seek to prevent the occurrence of casualties. Since present knowledge requires the assumption that casualties will result from attack, civil defense must be directed toward minimizing the effects. This would include limiting the number of casualties; shortening the period of morbidity; reducing or preventing fatalities, and preventing development of secondary cases. These objectives are essentially those of peacetime health and medical activities in respect to naturally occurring diseases.

Responsibilities.—Responsibilities for the peacetime health and medical activities rest with persons with professional and technical training (physicians, sanitarians, nurses, technicians) and with organizations (health departments, professional societies, hospitals, laboratories, professional schools). These persons and organizations, operating within the framework of the civil defense organization under the director of civil defense health services and special weapons defense, will be responsible for civil defense against biologic warfare.

Prevention of Attack.—Prevention of sabotage by biologic warfare agents will require vigilance on the part of police and health authorities so that potential saboteurs may be denied access to strategic buildings, important military or industrial installations, water supplies. Alertness on the part of laboratory directors and others who have charge of bacteriologic supplies and equipment will contribute to the prevention of sabotage by potential enemy agents or sympathizers who might attempt to manufacture biologic warfare materials within the United States. Prevention of attack with biologic agents as a part of overt warfare is essentially a military and intelligence problem and is not discussed.

Detection of Biologic Warfare Agents.—In peacetime, it is routine to test water, milk and certain food products to estimate their sanitary quality and assure their safety. Under certain circumstances, largely experimental until now, air is tested in limited areas to determine its bacteriologic content. (Testing of air to determine dust content is a long-established practice in industrial medicine.)

None of these peacetime methods are immediately applicable for detection of agents of biologic warfare. Many of them depend on reasoning from indirect evidence. For example, water is judged unsafe if contaminated by Escherichia coli, which is harmless; it is assumed that the water in question could contain intestinal pathogens if E. coli is present. However, basic principles can be adapted to examination of air, water, milk for the purpose of detecting biologic warfare agents, and equipment now in use (such as air samplers) can be suitably modified for such purposes.

Sampling stations can be set up to determine the normal bacterial population of the atmosphere in areas that might be targets for biologic warfare. Air can also be analyzed for distribution of particles of various sizes at given times and under varying conditions. Thus, a background of practice and experience can be built up to facilitate estimation as to the possibility of dissemination of biologic warfare agents in an area under observation. Bacteriologic analysis of water, milk and certain foods can be extended in scope in order to give more evidence than current methods provide for estimation of the possibility of intentional contamination.

These measures, however, have serious limitations at present. Even for bacteria readily grown on artificial media, a number of hours are required for cultures to develop sufficiently to permit accurate identification. Another limitation is the fact that isolation of viruses and rickettsiae requires animal inoculations, and usually several days must elapse before identification can be accomplished. Also nonliving toxic products of microorganisms can be identified only after time-consuming animal tests. Furthermore, it is not known whether sampling devices and isolation technics now available would be efficient enough to collect identifiable material even though pathogenic agents were present in adequate quantities to produce human disease. Another drawback is the fact that identification of many potential biologic warfare agents would require resources beyond the capacity of the average public health or clinical laboratory. Even when sampling and routine identification testing are confined to a search for organisms relatively easy to deal with in the laboratory, there would be the problem of avoiding the overburden of laboratories to the extent that other important work might suffer.

While these limitations must be faced, they do not justify a policy of inaction or delay. Some of the simpler operations of sampling and identification should be put into effect, and it may be anticipated that experience and research will ultimately overcome many of the initial difficulties, while others can be minimized by efficient organization.

Prevention of Casualties.—Theoretically, measures could be taken before an attack to prevent or reduce casualties, or they could be taken soon after an attack to limit the extent or degree of exposure.

Immunization: If it were known what agents a potential enemy might plan to use, it would be possible, in many instances, to protect personnel by widespread specific immunization. The disadvantages of putting such a program into effect in the predictable future are lack of adequate immunization against some agents that might be used; the often partial effectiveness of even successful immunization; the usually temporary character of artificial immunization, requiring repeated booster injections, and the objection of persons to a multitude of inoculations, especially if constantly repeated. However, mass immunization against a rather wide selection of agents has been extremely effective in military organizations, and its use for protection of civilian populations against some of the potential biologic warfare agents should be seriously considered if attacks are anticipated. It is not an easy answer to a difficult problem and cannot be relied on for satisfactory protection in most instances.

Physical Protection: Masks, clothing, ointments and shelters have been used since World War I as protection against poison gas. Similar devices, suitably adapted, can give protection against many biologic warfare agents. Their advantages and limitations are not directly a medical problem and hence are not discussed.

Decontamination: Water supplies that have been subjected to biologic warfare attack may be decontaminated by methods applicable to peacetime water sanitation. For biologic toxins, boiling will generally suffice; for living organisms, filtration, chlorination and emergency boiling, if necessary, can be employed. For contaminated surfaces, vegetation and clothing, standard methods of spraying, scrubbing or immersion in appropriate disinfectants would be applicable. All these methods would come into use after an attack and after primary casualties may be assumed to have occurred, but prompt attention to decontamination could prevent a significant number of delayed casualties.

Proper Handling of Exposed Persons: This requires attention to two methods of potential value in limiting the effects of an attack. Individuals known or presumed to have suffered exposure, but not yet sick, may in some instances be protected from illness, or the extent or severity of their illness may be reduced, by prompt treatment during the incubation period with appropriate specific agents, such as antibiotics known to be active against the agent used in the attack. Also if an infectious organism that is capable of spreading from person to person (e. g., a highly transmissible strain of influenza virus) has been used, isolation, quarantine and other temporary restrictive measures may be effective in preventing secondary cases or epidemics. (Wide scale immunizations might be feasible under certain circumstances of this nature.)

Decision as to when to use methods of the type discussed in order to prevent or limit the occurrence or severity of casualties will depend on careful judgment in any given situation. Knowledge of the behavior of specific infectious diseases under natural conditions, of the effectiveness of known methods of prevention and of the adequacy of treatment will form the basis for sound judgment, just as it does in respect to related situations brought about by nature.

Recognition of Cases.—The first step in the control of any disease outbreak is recognition of its presence. In regard to biologic warfare, it must be assumed that, in many instances, the first evidence of attack will be the occurrence of cases of disease or symptom complexes resulting from exposure. The physician in practice may see such patients before it is recognized that an attack has occurred. Therefore, one of the most important assets for defense against biologic warfare is a medical profession alert to the possibilities. Knowing what constitutes the usual incidence of diseases in his locality at various seasons, the practicing physician is generally quickly aware of any unusual illnesses or of familiar illnesses occurring in unexpected numbers. When there is reason to suspect that outbreaks of disease, or even a few apparently isolated cases might represent biologic warfare casualties, prompt reporting to the appropriate health authorities is essential. It then becomes possible to set into action the machinery for wide scale investigation and, if necessary, to institute control measures.

Health authorities may learn of suspicious circumstances before reports are received from physicians in practice. Absenteeism from schools or certain industries often constitutes the initial evidence of communicable disease outbreaks in peacetime and could give indication of a biologic warfare attack. Overloading of hospitals and clinics would also alert the authorities. Evaluation of communicable disease reports can furnish evidence for suspicion that an attack has occurred. All these possibilities can be developed to a greater state of efficiency than is usually considered necessary for peacetime communicable disease control.

Investigation of Outbreaks.—Any evidence that a biologic warfare attack might have occurred will require careful and thorough investigation by the health authorities. Such investigation would combine clinical, epidemiological and laboratory studies. The objectives of such an investigation would be the determination of whether a disease outbreak or an undue number of cases was occurring and the causative agents; investigation of the method of dissemination and whether the outbreak was due to natural causes or to biologic warfare attack; delineation of the area of contamination and investigation of the factors influencing the development of casualties, if biologic warfare appeared to be the likely cause; recommendation of methods of control, and, if necessary, provision for their execution.

Investigations of this sort would resemble in principle those which are carried out in peacetime when important disease outbreaks occur. The laboratory facilities which they require could be provided by the establishment of diagnostic and detection centers in strategic areas. These centers would make use of already existing facilities, such as local laboratories in health departments, universities, hospitals or private institutions, which could function within the limits of their professional and technical competence; such competence can

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be developed in selected laboratories beyond the peacetime level by training and financial assistance from federal authorities. (In addition to taking part in specific investigations of outbreaks, these laboratories would handle analysis and identification of material from sampling stations.) Regional centers having specialized skills and equipment not available at local laboratories could be developed in metropolitan areas on the basis of existing facilities in medical centers or larger health departments. Federal laboratories, such as the National Institutes of Health and the Communicable Disease Center of the United States Public Health Service and their branches, could be utilized. Regional and federal laboratories would be prepared to receive material for investigation and identification and to send out teams and critical material to aid local people. Military medical centers could complement and extend the potentialities of the regional and federal centers, and in times of stress, close liaison between the military and civilian laboratories and teams is anticipated.

Research.—More knowledge and better equipment will be required to permit the development of defense against biologic warfare to the extent that would permit maximum protection of personnel subject to attack. Such research would include the development of air sampling devices capable of detecting a wider variety of agents than currently possible; more rapid methods for isolation and identification of pathogenic agents; methods for active immunization after exposure; antigens capable of immunizing against whole classes of organisms rather than individual species or strains; mass immunization procedures that would permit immunization by inhalation of antigens by large numbers of persons simultaneously; procedures for sterilization of large air masses; information on optimal dosages of pathogenic agents and on infection rates after exposure to known dosages; measures for arresting infections during the incubation period by adequate, yet economical treatment, and specific treatment for diseases caused by smaller viruses. Information resulting from such research would be of great value in control of infectious diseases in peacetime, as well as for defense against biologic warfare.

Training.—Successful operation of a program of civil defense against biologic warfare will depend on the availability of trained and competent professional and technical personnel. Since the basic principles involved in such defense are the same as those that are fundamental to peacetime medicine and public health, it will be necessary to acquaint personnel now engaged in these activities only with those special procedures that adequate defense will require. Even these are quite similar to or in some instances identical with normal operational methods. Training of key personnel with policy, operational and technical responsibilities is one of the objectives of current federal planning for defense against biologic warfare and will be initiated by responsible federal agencies. Selected persons and groups so trained can arrange for orienting and drilling local personnel who will operate with them or under their direction.

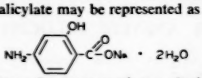
COUNCIL ON PHARMACY AND CHEMISTRY

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

R. T. STORMONT, M.D., *Secretary.*

Sodium *p*-Aminosalicylate. — Pasem Sodium (Massengill). — $C_7H_6NNaO_3 \cdot 2H_2O$.—M.W. 211.16.—The structural formula for sodium *p*-aminosalicylate may be represented as follows:



Actions and Uses.—See monograph on *p*-Aminosalicylic Acid.

Dosage.—3 Gm. five times daily for a total dose of 15 Gm. every 24 hours. The duration of treatment is the same as with *p*-aminosalicylic acid.

Tests and Standards.—

Physical Properties: Sodium *p*-aminosalicylate is a white to pale yellow, practically odorless, crystalline powder. It is freely soluble in water, sparingly soluble in alcohol and practically insoluble in ether. One gram dissolves in 50 ml. of water to give a clear solution which is colorless or nearly so. The solution has a *p*H between 7.0 and 7.5.

Identity Tests: Dissolve about 1 Gm. of sodium *p*-aminosalicylate in 25 ml. of water, acidify until the solution is just acid to bromophenol blue T.S., filter the mixture, wash the precipitate well with water and dry it in a vacuum desiccator. The *p*-aminosalicylic acid obtained responds to the identity tests in the monograph on *p*-Aminosalicylic Acid.

A 0.0006 per cent solution of anhydrous sodium *p*-aminosalicylate, prepared as directed in the assay, exhibits ultraviolet absorption maxima at about 2,650 Å. [E(1%, 1 cm.), about 748] and 2,990 Å., with minima at 2,440 and 2,850 Å. The ratio of the optical density at 2,650 and 2,990 Å. is between 1.50 and 1.56.

Purity Tests: Dissolve the residue from the ashing operation described later in 20 ml. of water, add 2 ml. of diluted acetic acid and make up to a total volume of 25 ml. with water. Add 10 ml. of hydrogen sulfide T.S.: the heavy metals limit (*U.S.P. XIV*, p. 717) is 25 ppm.

Place in an arsenic generator bottle 5 ml. of potassium iodide T.S. and 5 ml. of a 4 per cent solution of sodium *p*-aminosalicylate, and heat the solution to boiling. Cool, add 5 ml. of stannous chloride T.S., and proceed as directed in *U.S.P. XIV*, p. 686 starting with, "Set the apparatus aside at room temperature for a period of ten minutes." The stain produced is no greater than that produced by 0.0015 mg. of arsenic.

Dry about 1 Gm. of sodium *p*-aminosalicylate, accurately weighed, at 105 C. for 5 hours: the loss in weight is not less than 15.5 nor more than 18.5 per cent.

Char about 1 Gm. of anhydrous sodium *p*-aminosalicylate, accurately weighed, over a low flame. Cool the charred mass, then add 1 ml. of sulfuric acid and continue ignition until no carbon remains. Each gram of sodium sulfate formed is equivalent to 0.3238 Gm. of sodium. The amount of sodium present is not less than 12.8 nor more than 13.8 per cent.

Assay: (Sodium *p*-Aminosalicylate) Transfer 36 mg. of anhydrous sodium *p*-aminosalicylate, accurately weighed, to a 1000 ml. volumetric flask, add water to volume and mix thoroughly. Transfer exactly 10 ml. of the solution to a dry 125 ml. flask and add exactly 50 ml. of phosphate buffer [6.72 Gm. of monobasic potassium phosphate (KH_2PO_4) and 11.92 Gm. of anhydrous dibasic sodium phosphate (Na_2HPO_4) dissolved to make 1000 ml.]. Determine the optical density of the final solution (0.0006 per cent) at 2,650 Å. with a spectrophotometer. The number of milligrams of sodium *p*-aminosalicylate present per ml. of solution = optical density at 2,650 Å. ÷ 74.8. The amount of anhydrous sodium *p*-aminosalicylate present is not less than 96.0 nor more than 102.0 per cent.

Dosage Forms of Sodium *p*-Aminosalicylate

CAPSULES AND TABLETS. *Identity Tests:* The contents of the capsules or the powdered tablets respond to the identity tests in the monograph for Sodium *p*-Aminosalicylate.

Assay: (Sodium *p*-Aminosalicylate) Transfer an amount of powder equivalent to 36 mg. of anhydrous sodium *p*-aminosalicylate, accurately weighed, to a 1000 ml. volumetric flask and add water to volume. Proceed as directed in the assay for sodium *p*-aminosalicylate starting with, "Transfer exactly 10 ml. of the solution. . . ." The amount of sodium *p*-aminosalicylate is not less than 95.0 nor more than 105.0 per cent of the labeled amount.

Powder Sodium Para-Aminosalicylate: 454 Gm. bottles. American Pharmaceutical Company, New York, N. Y.

Tablets Sodium Para-Aminosalicylate: 0.5 Gm. American Pharmaceutical Company, New York, N. Y.

Capsules Pasem Sodium: 0.5 Gm. S. E. Massengill Company, Bristol, Tenn.

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NEED FOR ANESTHESIOLOGISTS

While the origins of anesthesiology as a segment of medicine go back for more than a century, its organized practice and recognition are so recent that it is considered a new medical specialty. In fact, the developments in the field of anesthesiology of the past two decades may properly be considered the cornerstone about which this medical discipline is now being built. Most notable, however, have been the rapid developments in this field since World War II, which have added tremendous strength, scope and promise to the future of anesthesiology.

Basic knowledge in this sphere has progressed from the unlamented era when it consisted almost wholly of the technical ability to render a patient insensitive to the process of surgery. As in other fields, adequate technical facility is taken for granted and has become quite secondary to the acquisition and application of information derived from the prolific researches in the fundamental laboratory and clinical sciences. By virtue of the present outlook, anesthesiology affords its practitioners, who are well trained and competent, the unusual opportunity to practice a clinical specialty, with all its satisfying facets, and to utilize simultaneously much of the spectacular knowledge gained from the basic sciences. In no uncertain manner has the anesthesiologist been transformed into a clinical physiologist and pharmacologist.

During the past few years many young physicians, aware of these opportunities, have entered the specialty of anesthesiology and have found an eminently satisfactory field of professional endeavor. They have recognized the importance and quality of the intellectual challenge it affords and have, in return, contributed a full measure of improved care and greater safety to patients.

The community need for modern anesthesiology is so great, however, particularly by virtue of the recent dramatic extensions of surgical treatment, that there already exists a nationwide critical shortage of bona fide anesthesiologists. A quality of anesthetic care commensurate with the quality of surgical care is lacking in too many localities. There is great need for more doctors in anesthesiology. The responsibility for obtaining more such specialists rests with the entire medical profession as well as with the relatively small number of anesthesiologists. One shortcoming has been that most medical students and interns, who constitute the major pool of physicians in the best position to select their future specialty, have too little exposure to the real nature of anesthesiology while they are undergraduates or interns. For this reason, too few are stimulated to investigate anesthesiology as a potential future specialty for themselves.

In similar fashion, too many older members of the medical fraternity are not fully aware of the essential nature of the specialty and therefore are not in a valid position to encourage younger men toward this end. Yet who can deny the emergence of the anesthesiologist as a necessary and critical participant in the joint medical effort that has been translated into the remarkable record of present-day surgery? The hospitals and the communities they serve would do well to foster and support all that is inherent in the worth-while practice of anesthesiology. The physician anesthesiologist, equipped to undertake this type of practice will find himself in a broad, well-grounded segment of the practice of medicine.

POSTIRRADIATION ANTIBODY FORMATION

In 1915 Hektoen [1] demonstrated that in experimental animals total body irradiation suppresses the usual antibody response to injected antigens. He ascribed this suppression to destruction of bone marrow and lymphatic tissues. This work has been corroborated and extended recently by Jacobson [2] and his associates of the Department of Medicine of the University of Chicago. These investigations exposed rabbits to 800 r of total body irradiation. In some of the animals either the spleen or the appendix was exteriorized through a surgical incision and protected from exposure by means of a lead shield. Twenty-four hours after exposure each animal received 1 cc. of 2 per cent suspension of washed sheep erythrocytes intravenously, as did also nonirradiated control animals. Blood samples were obtained before treatment and at intervals after immunization and the hemolysin titers determined by serial dilution studies. In control, nonirradiated animals hemolytic titers as high as 1: 5,120 were reached by the tenth day. In the unprotected irradiated animals the titer, if demonstrable, never exceeded 1: 80 and the maximum was not reached until at least the twenty-first day after immunization. In animals in which either the appendix or the spleen was shielded, the titers were in general somewhat lower than in the non-irradiated controls and the maximum was usually not reached until at least the twenty-first day. Titers as high as 5,120 units were occasionally noted. It seems evident from these data that total body irradiation completely destroys the specific antibody formation but that an intact spleen or appendix may fully perform this function.

1. Hektoen, L.: J. Infect. Dis. **17**: 415, 1915.
2. Jacobson, L. O.; Robson, M. J., and Marks, E. K.: Proc. Soc. Exper. Biol. & Med. **75**: 145 (Oct.) 1950.

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As an explanation of this effect, Jacobson and his associates found that within the first 24 hours after total body irradiation there is disintegration of the lymph nodes throughout the entire body with complete phagocytosis of the resulting lymphocyte fragments. Regeneration begins by the ninth to the twelfth day, with normal cellularity attained in about 21 days. In rabbits with lead-shielded spleen or appendix, total body lymphocyte regeneration is much more rapid, being well under way within four days. They suggest that in these animals the intact spleen or appendix initiates antibody production and that by the fourth or fifth day regenerated lymphatic tissue in other parts of the body can take over the function of antibody formation, if antigen is still present in the blood stream.

The collateral observation that uninjured lymphatic tissue in the lead-shielded spleen or appendix accelerates lymphatic regeneration in other parts of the body may conceivably lead to the discovery of a new hormonal mechanism.

FIRE HAZARDS

A recent report of the fire hazards encountered in an inspection of hospitals [1] suggests many ways for physicians to lessen dangers in their homes, offices and clinics. Hazards often occur because of inadequate planning when the facilities are built, but they also occur frequently because of their gradual development without being noticed by the physician or his associates. Careful study should elicit most weaknesses, but when there is any doubt about the thoroughness of the inspection an experienced examiner should be called. If remodeling is indicated, it probably will be cheaper to undertake whatever is necessary than to risk the danger of fire, loss of property and loss of life.

Among the hazards encountered in the hospital inspection program were improperly enclosed stairways and elevators; no evacuation plan; no emergency alarm system; electrical defects related to fuses; improper use of cords; defective fixtures and inadequate support of wires; improper storage of explosive and combustible material; inefficient fire appliances; exit doors opening inward; x-ray equipment not properly shielded; furnace rooms not kept in good condition, and lack of hand rails. Other dangers stemmed from poor housekeeping, blocked exits, lack of metal containers for oily waste material, improperly equipped Bunsen burners and other gas devices, lack of shut-off controls in air-conditioning systems, improper storage of x-ray film, improper construction and location of incinerators, lack of satisfactory fire escapes, oil-soaked floors and careless disposal of trash. Even cracked chimneys, storing of ashes in wooden containers, worn stair treads and wooden clothes lockers were found occasionally.

This report is not necessarily in any way a reflection on hospital practices. It merely reveals what was found in a statewide survey under the National Board of Fire Underwriters hospital inspection program. Obviously such weaknesses should be and usually are corrected promptly when reported to responsible individuals. They are mentioned on this page only to point out to physicians that there are many fire hazards which may pass unnoticed unless thorough inspections are made at reasonably frequent intervals. While findings in hospitals are not always applicable to house and office conditions, there is much in common in many instances.

CORTISONE IN TUBERCULOSIS

The suggestion that caution should be exercised in the administration of cortisone to patients with tuberculosis is made by Michael [1] and his associates of the Department of Medicine, Emory University, as a result of tests on tuberculous animals. Albino rats are naturally highly resistant to tuberculosis. After an injection with virulent human tubercle bacilli, no gross or microscopic lesions develop, despite the fact that tubercle bacilli can be cultivated from tissues as long as 120 days after inoculation.[2] The Emory University pathologists believe the nature of this tuberculosis resistance is indicated by the quantitative cellular response to intraperitoneal injection with liquid petrolatum.[3] In rats the oil-induced exudate is strikingly different from that in rabbits, which are naturally susceptible to tuberculosis. In rats the exudate is richer in total cells and is particularly rich in mononuclear cells. The investigators found that administration of cortisone depresses the total exudate formation in both rats and rabbits, with the total and differential cell counts in the rat approaching those in the normal rabbit.

These results suggested that tuberculosis in the normally resistant rat might be altered by cortisone administration. Groups of from 15 to 20 rats were therefore given intraperitoneal injections with 2 to 4 mg. of a young culture of Mycobacterium tuberculosis. About half of each group was given a daily injection of 5 mg. of cortisone during the experiment. In one experiment all control animals given Myco. tuberculosis culture alone survived by the end of the experiment (42 days). Of those given cortisone, only 10 per cent survived. In a second experiment 100 per cent of the animals given Myco. tuberculosis culture alone survived (52 days) as contrasted with a 30 per cent survival of those given injections of bacilli and treated with cortisone. Histological examinations showed that under the influence of cortisone tubercle bacilli are able to multiply more rapidly than in control rats and can produce more diffuse lesions. These conclusions are in accord with the adverse effects of cortisone in guinea pig tuberculosis recently reported by Spain and Molomut.[4]

1. Hudenburg, R.: Fire Hazard Check List Based upon State-Wide Survey, Hospitals **25**: 83 (March) 1951.

1. Michael, M., Jr.; Cummings, M. M., and Bloom, W. L.: Proc. Soc. Exper. Biol. & Med. **75**: 613 (Nov.) 1950.

2. Ornstein, G. G., and Steinbach, M. M.: Am. Rev. Tuberc. **12**: 77 (Sept.) 1925.

3. Bloom, W. L.; Cummings, M. M., and Michael, M., Jr.: Proc. Soc. Exper. Biol. & Med. **75**: 171 (Oct.) 1950.

4. Spain, D. M., and Molomut, N.: Am. Rev. Tuberc. **62**: 337 (Oct.) 1950.

ORGANIZATION SECTION

FEDERAL LEGISLATION

Civil Defense

Senator Lodge of Massachusetts introduced S. 1043, which would amend the Federal Civil Defense Act of 1950 to make further provision for certain research and development. The amendments would authorize the Federal Defense Administrator, in cooperation with the Department of Defense and other departments and agencies, to establish and conduct a program of research and development designed to make more effective the measures for the protection of the civil population in the event of military attack. Senator Lodge hopes that this bill would: (*a*) provide the basis for intelligent planning of civil defense operations by responsible national officials, (*b*) provide standards to guide the several states and the municipalities in establishing plans and procedures that will meet individual local needs and yet be sufficiently uniform to permit necessary interstate cooperation, (*c*) provide for a better understanding of methods that can be employed to prevent panic and to sustain civilian morale in time of emergency, (*d*) protect the public against the false security that accompanies reliance on outmoded methods and equipment and (*e*) protect the public against the waste, and against the unsoundness, of solutions proposed by cranks and enthusiasts.

School Health Services

H. R. 3030, introduced by Representative Bolling of Missouri, proposes to make more adequate provision for the health of school children through the development of school health services for the prevention, diagnosis and treatment of physical and mental defects and conditions. This bill is identical with S. 1411 of the 81st Congress, commonly referred to as the School Health Services Bill. It is also identical with H. R. 42 of the present Congress introduced by Representative Coudert and reported previously. Representative Burnside, of West Virginia, introduced H. R. 3079, which is similar but contains several minor additions. It would make eligible for examination and treatment all children between the ages of 5 and 17, whether attending school or not, and excepts from the medical program children of parents whose religious beliefs oppose medical care.

Military Deferment for VA Medical Personnel

In H. R. 2996, Representative Rogers of Massachusetts proposes to amend the act entitled "An Act to establish a Department of Medicine and Surgery in the Veterans' Administration." Her bill proposes to authorize the President to utilize certain units of the Department of Medicine and Surgery in the VA during periods of emergency or war. The bill would authorize the President, in time of war or emergency, to constitute the Department of Medicine and Surgery of the VA a branch of the military forces. Personnel would be subject to the Articles of War and the Uniform Code of Military Justice, which would make them exempt from military service in order that they might continue their service in the care and treatment of veterans.

Compulsory Total Disability Insurance

Representative Perkins of Kentucky introduced H. R. 3021, which would amend the Social Security Act to provide disability insurance benefits for totally disabled persons, and establish a national program of compulsory total disability insurance similar to the suggested program considered and rejected during the last Congress. This program would cover all persons presently covered by Social Security. Benefits would be paid to persons who suffer a compensable disability after a waiting period of approximately seven months. The term "disability" is defined as inability to engage in any substantially gainful activity by reason of any medically demonstrable physical or mental impairment, including blindness. The Federal Security Administrator would be authorized to make provisions for determinations of disability and redeterminations at intervals prescribed by him. He would be further authorized to secure the cooperation of appropriate agencies of the United States, or any state or its political subdivisions, and the cooperation of private medical, dental, hospital, nursing, health, educational, social and welfare groups, and to enter into voluntary working agreements with them to insure efficient administration of this program. The Federal Security Administrator could make the necessary expenditures, including a fee for examination of claimants "if the examination is made by a physician who is not an employee of the United States."

Rerental Rights for Physician Veterans

A bill to provide that physicians who serve on active duty in the present emergency shall, after their release, be granted a priority in renting office space they occupied when they entered on active duty was introduced by Representative Hays of Arkansas. This bill, H. R. 3029, would establish rerental rights of physicians' offices for all physicians who serve on active duty for a period of 90 days or more after June 25, 1950. The Administrator of Veterans' Affairs would prescribe regulations necessary to carry out the purpose of the bill. After a reasonable time following release from active duty, a physician failing to exercise rerental rights might lose them. Once the right is exercised and office space is rerented, after military duty, physicians would be protected for a period of three years, giving them preference over any other tenant except: "(1) another doctor veteran who has the same right with respect to office space, or (2) a tenant who agrees to terms more favorable to the landlord than those to which the doctor veteran will agree." In case any landlord violates any regulation prescribed under the bill, the District Court of the United States for the district in which the office space involved is situated would have jurisdiction to require the landlord to comply with the regulation and to compensate the physician for any loss of benefits.

STATE LEGISLATION

Arkansas

Bill Introduced.—H. 456, proposes to authorize the board of medical examiners, and a special examining committee of physical therapists, to license and regulate the **practice of physical therapy** which is defined to mean the treatment of any bodily or mental condition by any person by the use of the physical, chemical and other properties of heat, light, water, electricity, massage and active and passive exercise. The use of roentgen rays and radium for diagnostic and therapeutic purposes and the use of electricity for surgical purposes, including cauterization, would not be authorized by the proposal. The proposal further defines a physical therapist as a person who practices physical therapy under the prescription and direction of a licensed medical practitioner.

Bill Enacted.—H. 195, has become Act 184 of the Acts of 1951. It prohibits the sale of **barbituric acid, amphetamine, desoxynor-ephedrine,** except on the written and signed prescription of a person licensed by one of the medical boards, a person legally qualified to practice dentistry or veterinary medicine or by a legally qualified dispensing physician, with certain exceptions relating to wholesale sales of such preparations. This law amends, in effect, a 1935 law which applied only to barbituric acid.

Georgia

Bills Enacted.—H. 54, has become Resolution No. 32 of the Acts of 1951. It provides that there shall be submitted to the voters of Georgia a resolution recommending or creating a **state medical education board** to receive and pass on, allow or disallow applications for loans or scholarships made by students who are bona fide citizens and residents of the state, who desire to become doctors of medicine and who are acceptable for enrolment in a qualified four-year medical school. H. 255, has become Act No. 276 of the Acts of 1951. It provides for the creation of a **state board of examiners of psychologists.** A psychologist is defined as a person who holds himself out to be an applied psychologist and renders to individuals or to the public, for fees, any service involving the application of recognized principles, methods and procedures of the science and profession of psychology, such as interviewing, administering and interpreting

The summary of federal legislation was prepared by the Washington Office of the American Medical Association and the summary of state legislation by the Bureau of Legal Medicine and Legislation.

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tests of mental abilities, aptitudes, interests and personality characteristics for such purposes as psychological diagnosis, classification or evaluation or the educational or vocational placement or for such purposes as psychological counseling, guidance or readjustment. Nothing in this law shall be construed as permitting the administration or prescription of drugs or as infringing on the practice of medicine. S. 53, has become Act 502 of the Acts of 1951. It provides for the creation of a **Georgia commission on alcoholism** to study the problem of alcoholism, including methods and facilities available for the care, custody, detention, treatment, employment and rehabilitation of alcoholics. S. 63, has become Act 270, Acts of 1951. It provides an appropriation to the state board of education for the creation of a **state educational research service** to develop materials and units of instruction of the scientific facts in regard to the influence and effect of alcohol on human health and behavior and on social and economic conditions, including suggestive methods of instruction of ways of working with boys and girls and young persons in the various age groups and grade levels of the public, elementary and secondary schools, as aids to classroom teachers and others responsible for the conduct of the educational program in the public schools.

Illinois

Bills Enacted.—H. 248, to amend the medical practice act, proposes to permit the **suspension of a license to practice medicine** on the entry of a decree by any court of competent jurisdiction establishing mental illness of any person holding a license under the medical practice act. S. 141, proposes to authorize the department of registration to appoint a **chiropractic examining board** and defines chiropractice as the philosophy, science and art of things natural, a system of locating misaligned or displaced vertebrae of the human spinal column, the procedure preparatory to and the adjustment, by hand, of such misaligned or displaced vertebrae of the human body, without the use of drugs or surgery, for the correction of the cause of disease, together with the use of scientific instruments for analysis and diagnosis.

Indiana

Bill Enacted.—S. 100 was approved February 24, 1951. It requires **all physicians to report** to the state board of health the name, age, and address of every person given a diagnosis by him of **epilepsy** or other similar disorder characterized by lapses of consciousness.

Kansas

Bills Introduced.—H. 487, proposes circumstances under which licensed **osteopaths** may apply to the board of medical examiners for an examination for a license to use and prescribe any drug or chemical the use of which is taught in the curriculum of legally incorporated schools or colleges of osteopathy of good repute and to do and perform minor surgery as defined by the proposal. H. 489, proposes to require any person holding himself out as a doctor to practice healing of human beings to append to his name the recognized title or abbreviation **designating the healing profession** he is licensed to practice in the state. Clinics must list on their door the names, with the appropriate titles and abbreviations, of all of the doctor members of the staff.

Maine

Bills Introduced.—H. 1487, proposes the creation of a **state fund for alcoholics,** the fund to be used for studying the problems of alcoholism, including methods and facilities available for the care, custody, detention, treatment, employment and rehabilitation of persons addicted to the intemporate use of spirituous or intoxicating liquor. S. 384, proposes to require all children entering into any school to present to the teacher evidence of having been **innoculated for smallpox** and proposes to require all children under 12 to present a certificate from a physician or health officer that such child has been **immunized against diphtheria.** S. 418, proposes to authorize the department of health to prepare and distribute within the state and sell or give away **antitoxins, serums, vaccines, viruses** and analogous products applicable to the prevention or cure of disease of man as an aid in national defense in case of war or emergency. S. 454, proposes to authorize the commissioner to make rules and regulations and to issue permits to any person, firm or corporation to take, have in possession, band and transport wild birds and **animals for scientific purposes.**

Maryland

Bill Introduced.—S. 270, proposes to authorize persons with a bachelor of science degree and five years' experience under the supervision of an optometrist or oculist to take the examination required for **optometrists** and to be licensed if they pass such examination.

Minnesota

Bill Introduced.—S. 916, proposes an enabling act for the organization of nonprofit medical service plan corporations which include the furnishing of dental services.

Missouri

Bill Introduced.—S. 136, proposes an **enabling act** for the organization of dental expense indemnity corporations, medical expense indemnity corporations and hospital service corporations.

Nevada

Bill Introduced.—A. 277, proposes the establishment of a **Nevada Cancer Patrol Board** to formulate and put into effect an educational plan for the purpose of preventing cancer throughout the state of Nevada, for the purpose of aiding in the early diagnosis of cancer and for the purpose of informing cancer patients of the proper treatment.

New Hampshire

Bill Introduced.—S. 45, proposes the creation of a **state board of registration for licensed physical therapists** and defines physical therapy as the treatment of any bodily or mental condition of any person by the use of the physical, chemical and other properties of heat, light, water, electricity, massage and therapeutic exercise.

New Jersey

Bills Introduced.—A. J. R. 9, proposes the creation of a joint commission to investigate the **hospital service plan of New Jersey** as to the premiums now being paid and the allowances being paid to hospitals and the salaries and expenses being paid to executives. A. 428, proposes the creation of a **state board of examiners of psychologists.** A person would be deemed to be practicing psychology under this proposal who renders to individual clients or to the general public any professional service requiring the application of recognized principles and procedures of the science and profession of psychology such as counseling, interviewing, administration and interpretation of statistically standardized tests of mental ability and personality characteristics for the purpose of psychological appraisal for the betterment of human welfare. Nothing would permit the licensee to practice medicine.

New York

Bills Introduced.—A. 2490, A. 2549, S. 2292 and S. 2293 propose the enactment of a comprehensive statewide system of **health insurance.** A. 2508, proposes the creation of a **state board of chiropractic examiners** and defines chiropractic as the science of the locating and removal of nerve interference in the human body, according to chiropractic principles, where such interference is the result of, or caused by, misalignment or subluxations of the vertebral column. It excludes operative surgery, the reduction of fractures, the prescription or use of drugs or medicine and the practice of obstetrics. A. 2960, proposes the creation of a commission to study the needs of **chronic nonrehabilitatable alcoholics.** A. 3034, proposes regulations whereby the commissioner of health may designate approved laboratories or institutions wherein properly conducted **scientific tests,** experiments or investigations **involving the use of living animals** may be performed or conducted. A. 3141, proposes the addition to the state board of medical examiners of a licensed **naturopath** so that the board may issue licenses to naturopaths which would permit the holder to administer oral toxic drugs or perform major surgery. A. 3204, to amend the education law program, proposes that no tuition fee shall be charged in any of the **schools of medicine** established pursuant to the provisions of the education law. S. 2807, proposes the development of programs for research activities in the diagnosis, prevention and treatment of mental retardation and **epilepsy.**

Pennsylvania

Bills Introduced.—H.R. 15, proposes a resolution approving the **free distribution of influenza vaccine** to all the people of Philadelphia. H. 331, relating to the **qualifications of a medical examiner** in connection with private and parochial schools, proposes that such medical examiners shall be licensed physicians qualified to practice medicine and surgery or osteopathy or osteopathic surgery. H. 332, proposes that the word **"physician"** as used in the statutes shall include individuals licensed to practice medicine and surgery and individuals licensed to practice osteopathy or osteopathic surgery. H. 463, proposes that no hospital shall discharge any **incurable patient** if such patient is, or someone else is, currently paying for the care of such patient. H. 536, proposes to make it unlawful to sell, give away or otherwise dispose of **venereal prophylactics** except by a licensee under the conditions specified in this proposal. The proposal exempts physicians when disposition is being made in the regular practice of their profession to their patients. H. 537, proposes to require the board of school directors of each high school to include at least a four-semester course in **practical nursing.**

Rhode Island

Bills Introduced.—H. 746, proposes to require the state of Rhode Island to provide **state paid hospital and medical services** for all state employees. H. 748, proposes the creation of a special commission to study and report on the feasibility of setting up a **medical school** at Rhode Island State College. H. 752, proposes the creation of a **division of alcoholism** to promote studies on alcoholism and to promote or conduct educational and preventive programs on alcoholism.

South Dakota

Bill Enacted.—H. 66, was approved February 27, 1951. It authorizes the performance of an **autopsy** by a physician or surgeon when authorized (a) by the decedent during his lifetime, (b) by the decedent's surviving spouse, (c) if the surviving spouse is incompetent or if there be no surviving spouse then by an adult child, parent, brother or sister of the decedent.

Texas

Bills Introduced.—H. 424, to amend the **basic science act,** proposes to authorize the secretary to issue **temporary licenses** under certain circumstances which would be valid only until the date of the next board meeting. H. 425, to amend the **medical practice act,** proposes to authorize the secretary to issue **temporary licenses** to practice medicine to applicants with certain qualifications, such temporary licenses to be vaild only until the date of the next board meeting. S. 295, proposes to make it unlawful to sell or deliver any **barbituric acid, amphetamine and desoxyephedrine** except by a pharmacist on an original prescription of a physician, dentist, chiropodist or veterinarian. The proposal contains certain exemptions relating to wholesale sales.

MEDICAL NEWS

CALIFORNIA

Civil Defense Meeting.—The California Medical Association is sponsoring a special civil defense meeting at the Hotel St. Francis in San Francisco March 31 from 10:00 a. m. to 4:30 p. m. The purpose is to aid county medical society emergency medical service committees in civil defense planning and to present a résumé of civil defense activities to date. The program is as follows:

Major Gen. Walter M. Robertson, director, Civil Defense Organization and Planning in California.
A Federal Defense Administrator representative, Washington, D. C., The Overall Federal Civil Defense Program.
Robert Dyar, San Francisco, Medical and Public Health Civil Defense Measures in California.
George M. Uhl, Los Angeles, Civil Defense Organization of a Major City from the Medical Standpoint.
Frank F. Schade, Los Angeles, Civil Defense Organization of a County Medical Society from the Medical Standpoint.
Birchard M. Brundage, San Jose, Present Status of Radiological Defense Activities in California.

New Medical School to Open.—The University of California at Los Angeles' new medical school will open its doors to the first class of students next September 19. Applications are soon to be accepted for the first class of 25 first-year medical students; last day for filing such applications is May 15. Requests for information about applications should be addressed to U. C. L. A.'s Office of Admissions, 405 Hilgard Avenue, Los Angeles 24. The first class will use teaching material provided by the 750 bed Harbor General Hospital in Torrance and the 1,500 bed U. S. Naval Hospital at Long Beach.

Dr. Stafford L. Warren, formerly professor of radiology at the University of Rochester (N. Y.) School of Medicine and Dentistry, was appointed dean of the medical school in 1947. Assistant dean is Dr. Norman Nelson, former medical director of the Los Angeles City Health Department. In the past three years the school has acquired a staff of 22 full-time faculty and 98 clinical appointees. Department heads include: surgery, Dr. William P. Longmire Jr.; medicine, Dr. John S. Lawrence; anatomy, Dr. Horace W. Magoun; infectious diseases, Dr. Charles M. Carpenter; obstetrics and gynecology, Dr. Daniel G. Morton; radiology, Dr. Andrew H. Dowdy; pediatrics, Dr. John M. Adams, and hospital administration, Kenneth M. Eastman. This staff has been doing medical research, organizing curricula and working on plans for the $15,500,000 U. C. L. A. Medical Center. The statement issued by President Sproul and Dean Warren reads as follows: "The School of Medicine at the University of California at Los Angeles has been in its organizational stages for the last several years, and another several years will be required for completion of the physical facilities. However, sufficient space has been made available on the campus and on nearby university property to accomodate a small first-year class in the fall of 1951. In the ensuing years it will be possible to provide for the new classes as they enter and the old classes as they progress."

COLORADO

Rehabilitation of Asthmatic Children.—The National Home for Jewish Children, Denver, since 1940 when it undertook the long-range care of asthmatic children, has broadened its functions to embrace a specific medical, social and psychiatric approach to the management of chronic, refractory allergic conditions. Its facilities are available to children with chronic asthma who are not responding to the accepted standards of modern medical treatment in their own communities. The home has facilities for 140 children. Physicians, through Family Social Service Agencies and private sources, may refer allergic children to the home, a nonprofit organization supported by private philanthropy. The average stay is about two years. Applications may be made by getting in touch with the New York office of the home at 1407 Broadway, New York 18, or the Los Angeles office, 3932 Wilshire Blvd., Los Angeles, or by writing to the home at 3447 West 19th Avenue, Denver 4.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least two weeks before the date of meeting.

DELAWARE

Dr. Tarumianz Honored.—The Delaware Chamber of Commerce honored Dr. Mesrop A. Tarumianz, superintendent of the Delaware State Hospital, Farnhurst, at a dinner meeting when it made the first presentation of the Marvel Cup, which is to be awarded each year to the citizen making an outstanding contribution to his fellow men. Dr. Tarumianz is associate editor and managing editor of the *Delaware State Medical Journal*. He was cited as a "man of vision, energetic personality, sympathetic physician, skilled psychiatrist, efficient administrator, outstanding citizen . . ." The cup award was established by the late Josiah Marvel, a Delaware attorney.

FLORIDA

State Medical Meeting at Hollywood.—The annual meeting of the Florida Medical Association will be held at Hollywood, with headquarters at the Hollywood Beach Hotel, April 23-25, under the presidency of Dr. Herbert E. White, St. Augustine. Out-of-state speakers include:

Curtice Rosser, Dallas, Texas, Melanoma and Carcinoid of the Rectum.
Grayson L. Carroll, St. Louis, Antibiotics in the Treatment of Urinary Infections.
Lon Grove, Atlanta, Ga., (by invitation) Surgery of the Biliary Tract.
Kenneth S. Landauer, New York, Medical Care Problems in Poliomyelitis.

There will be technical and scientific exhibits. The association dinner will be held Tuesday at 7 p. m. The Woman's Auxiliary to the association will meet at the hotel April 22-24. Alumni and fraternity suppers will be held on Monday at 6:00 p. m. Specialty group meetings are scheduled for April 21-22.

ILLINOIS

Scholarship in Public Health.—This year a scholarship for a year's graduate study in public health is being offered by the W. P. Shahan Memorial Scholarship Committee of the Illinois Tuberculosis Association and its affiliated organizations as a memorial to their former executive secretary. Effective for the fall term of 1951, the scholarship will provide a full course of study in any field of public health leading to a graduate degree from an accredited school of public health. It provides a stipend of $100 a month, tuition and traveling expenses. Applicants must be residents of Illinois and meet the entrance requirements of the school of public health, which include a bachelor's degree from a recognized college. The application forms, which may be obtained from Mr. Ben D. Kiningham Jr., Executive Secretary of the Illinois Tuberculosis Association, 730 South Sixth Street, Springfield, must be completed by March 31.

Chicago

Personal.—Dr. Herman L. Kretschmer is the first physician to be elected honorary life member of the Toledo (Ohio) Academy of Medicine. At the academy's annual meeting in January he presented a paper entitled "American Medicine on the March."

Society Meeting.—The North Side Branch of the Chicago Medical Society, meeting April 5 at the Drake Hotel, will hear Dr. Percy E. Hopkins speak during dinner on "The Program of the Committee on Medical Service and Public Relations of the Illinois State Medical Society." Dr. Robert Elman, St. Louis, will speak at the scientific session on "Important Factors in the Preparation for Abdominal Operation." The concluding speaker will be Dr. Charles D. Puestow on "Transthoracic Surgery of the Stomach and Esophagus."

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Bronchoscopy Course at Illinois.—The University of Illinois College of Medicine is offering a course on "Bronchoesophagology for Anesthesiologists" April 23-28, 9:00 a. m. to 5:00 p. m., with Saturday classes optional. The course will consist of lectures, demonstrations and laboratory work on dogs and will be under the direction of Dr. Paul H. Holinger. Registration is limited to 15. The $100 fee is payable prior to registration. Those desiring to register should request forms from Max S. Sadove, M.D., Division of Anesthesia, University of Illinois, College of Medicine, 1853 West Polk Street, Chicago 12.

MASSACHUSETTS

Personal.—Dr. Peter V. Karpovich, professor of physiology, Springfield College, Springfield, has been appointed consultant to the Army Surgeon General, to advise on problems on artificial respiration. Dr. Karpovich is conducting a study supported by a grant from the joint Armed Forces regarding the comparative merits of various methods of artificial respiration.

Hospital Alumni Clinical Meeting.—The Boston City Hospital Alumni Association will hold its Alumni Day Clinical Program April 28. Papers will be presented in three sections, namely, medical, surgical and orthopedic, during the morning. At noon Dr. Chester S. Keefer, Brookline, will deliver the General Leonard Wood Oration at a meeting of the medical section on "Use of Antibiotics." Dr. George F. Lull, Secretary and General Manager of the American Medical Association, Chicago, will speak on "Some of Organized Medicine's Problems."

MINNESOTA

Symposium on Lupus Erythematosus.—The University of Minnesota, Minneapolis, announces a symposium on lupus erythematosus at the Center for Continuation Study April 5-6. The symposium is intended especially for doctors specializing in dermatology and internal medicine. A cordial invitation is also extended to general physicians. Visiting physicians who will participate include Drs. John R. Haserick, Cleveland, Paul Klemperer, New York, and Louis J. Soffer, New York. The remainder of the faculty will be made up of members of the staff of the University of Minnesota Medical School and the Mayo Foundation. The course is given under the direction of Dr. Henry E. Michelson.

MISSOURI

County Society Admits Negro Members.—The Jackson County Medical Society on February 26 admitted six Negro physicians to membership. They were the first to apply since the constitution of the county society was amended Oct. 24, 1950. The county society action followed similar action of the Missouri State Medical Association in March 1949. The Negro physicians admitted to the Jackson County Medical Society are: Drs. Bruce P. McDonald, Carl M. Peterson, Walter R. Peterson, John F. Ramos Jr., Samuel U. Rodgers and Luke E. Williams.

NEW YORK

Testimonial Dinner for Dr. Leary.—At a testimonial dinner March 1 at the Hotel Rochester, Dr. Montgomery E. Leary, Rochester, was honored by 150 friends. Plaques and scrolls and a book of testimonial letters were presented to him by civic organizations indicating the many ways in which he contributed to the health and strength of his community. Groups of friends came from as far as Buffalo and Niagara Falls. Dr. Leary organized the first open air school for pretuberculous pupils in New York State in 1908 and was a founder, superintendent, secretary and treasurer of Iola-Monroe County Tuberculosis Sanatorium and founder of the Rochester Health Association. He has been active in the American Legion since World War II. He is a colonel in the Medical Reserve Corps, and since the Korean conflict, he has headed a group of physicians examining men from seven counties for the draft, as well as enlistees.

Postgraduate Lectures.—The Medical Society of the State of New York, with the cooperation of the state department of health, has arranged the following postgraduate lectures:

TIOGA COUNTY MEDICAL SOCIETY

March 29, Milton J. Matzner, Brooklyn, Gastric Carcinoma, 6: 30 p. m., Brush and Palette Inn, Owego.
April 6, Alfred P. Ingegno, New York, Diarrheal Conditions, 6: 30 p. m., Iron Kettle Inn, Waverly.

The Unity Hospital staff of Brooklyn, meeting at the hospital April 12 at 10:30 a. m., will hear Dr. Raymond J. Pieri, Syracuse, speak on "The Female Perineum" and "Prolonged Labor and Pre-Operative Treatment." Dr. Milton Plotz, New York, will speak on the "Medical Treatment of Hypertension" before the Utica Academy of Medicine at the Hotel Utica April 19 at 8:00 p. m.; Dr. J. William Hinton, New York, will follow him, speaking on the surgical treatment of the condition. The Cayuga County Medical Society will meet April 19 at 8:30 p. m. at the Auburn City Hospital in Auburn. Dr. Andrew A. Marchetti, Washington, D. C., will speak on "The Role of the Practitioner in Diagnosis and Treatment of Female Genital Carcinoma."

New York City

Society Honors Secretary.—At its Thirtieth Anniversary Dinner March 7 the New York Society for Physical Medicine honored Dr. Madge C. L. McGuinness, its secretary for many years. The dinner was held at the New York Academy of Medicine Building.

Meeting on Thoracic Pathology.—The Tuberculosis Sanatorium Conference of Metropolitan New York at its clinical session on Chronic Pulmonary Diseases April 4 will present selected cases of thoracic pathology at the Cornell University Medical College Amphitheatre. The program has been designated "Residents Night."

Janeway Lecture.—Dr. Harry S. N. Greene, Anthony N. Brady Professor of Pathology, Yale University School of Medicine, New Haven, Conn., will deliver the Edward Gamaliel Janeway Lecture at Mount Sinai Hospital March 27 at 8:30 p. m. in Blumentthal Auditorium on "Significance of the Heterotransplantability of Human Cancer."

Society Meeting.—Dr. Max Cutler of the Chicago Tumor Institute will read a paper on "The Problem of Extractions in Relation to Osteoradionecrosis Complicating Radiotherapy of Intra-Oral Cancer" at the monthly conference of the New York Institute of Clinical Oral Pathology. The meeting will be held March 26 at the New York Academy of Medicine, Room 440, at 9:00 p. m.

Miller Memorial Lecture.—The fifteenth Adam M. Miller Memorial Lecture of the Theta Chapter of the Phi Lambda Kappa was delivered by William U. Gardner, Ph.D., professor and chairman of the department of anatomy at Yale University School of Medicine, New Haven, Conn., March 14 at the State University of New York College of Medicine on "Hormonal Aspects of Ovarian and Lymphoid Tumorigenesis." The lectureship was created in 1936 by the fraternity in honor of the former professor of anatomy and dean of the Long Island College of Medicine.

OHIO

Narcotic Violation.—Dr. J. Knox Gibson, Cambridge, pleaded guilty at Columbus to an indictment charging a violation of the federal narcotic law and on January 10 was placed on probation for a period of five years.

Appoint Professor of Psychiatry.—Dr. Ralph M. Patterson, University of Michigan Medical School, Ann Arbor, has been appointed head of the professional staff at the new Columbus Receiving Hospital in the new Ohio State University Health Center and professor of psychiatry in Ohio State University College of Medicine, Columbus. Dr. Calvin L. Baker, state commissioner of mental hygiene, has been designated to supervise the institution for the department of

public welfare. The new 140 bed receiving hospital, nearing completion, is designed for the treatment of neuropsychiatric patients and is to be operated in connection with the medical college of the university. The university will furnish professional services, heat, food and laundry. The welfare department will have full charge of the admission and discharge of patients and will provide the clerical and stenographic staff and the custodial, food service and maintenance workers. Dr. Patterson has been with the Neuropsychiatric Institute in the University Hospital at Ann Arbor since 1937 and assistant director since 1939, and has been on the teaching staff in psychiatry of the University of Michigan Medical School since 1937, holding the rank of professor since July 1, 1947.

OKLAHOMA

Chicago Professor to Speak March 26.—Dr. John W. Huffman, associate professor of obstetrics and gynecology, Northwestern University Medical School, Chicago, will speak before the Tulsa County Medical Society on March 26 on "Stress Incontinence." His paper will be preceded by a buffet dinner in the Terrace Room of the Mayo, served from 6:30 p. m. to 7:45 p. m.

TEXAS

Course in Military Preparedness.—The physicians of north Texas have requested an additional one day session on military preparedness for emergency disaster. Members of the staff of the University of Texas Medical Branch, Galveston, will offer the course at Dennison April 20.

Medical Center News.—Affiliation of St. Joseph's Infirmary and the Southern Pacific Hospital, Houston, in the teaching program of the Texas Medical Center through agreements with the University of Texas Postgraduate School of Medicine has been announced. The university regents also approved establishment of a branch of the Postgraduate School in San Angelo and the appointment of additional professors and instructors for the Houston school and the branch now functioning in San Antonio. Dr. Victor E. Schulze was appointed director of the San Angelo division, where refresher courses for practicing physicians and a residency training program will be initiated immediately. Headquarters for the new division will be in the Shannon West Texas Memorial Hospital of San Angelo, which also will serve the West Texas area as the central teaching institution of the school. In San Antonio, where the branch was established last July, Dr. James A. Bethea is assistant dean. Residency programs now are conducted there by the school, and on March 1 the first refresher courses for Texas physicians was started. Additional appointments to the clinical faculty of the main division of the school in the Texas Medical Center were approved by the regents. Professors were named as follows: Dr. Benjamin W. Turner, urology; Dr. Helmuth J. Ehlers, surgery; Dr. George W. Waldron, surgery; Dr. Paul V. Ledbetter, medicine; Dr. Moise D. Levy Sr., medicine; Dr. Robert A. Johnston, obstetrics and gynecology; Dr. Edward T. Smith, orthopedic surgery, and Dr. Valliant C. Baird, industrial medicine. Dr. Albert C. Broders was appointed clinical professor of pathology. Associate professors were named as follows: Drs. Joseph R. Gandy, J. Peyton Barnes and William D. Seybold, surgery; Dr. Allan P. Bloxsom, pediatrics; Drs. Hatch W. Cummings Jr., Dolph L. Curb, Edmond K. Doak, Thomas J. Fatherree, Stephen A. Foote Jr., DeWitt H. Hotchkiss Jr., William V. Leary, Edgar M. McPeak and Ephraim L. Wagner, associate professors of medicine. Assistant professors for the Houston school were named as follows: Dr. Raleigh W. Baird Jr., T. R. Jones, Samuel I. Miller, L. Rodney Rodgers and Jesse W. Hofer in medicine; Dr. Charles A. Dwyer and Dr. William W. Coulter in forensic medicine and pathology. A residency training program will be conducted in St. Joseph's by the Postgraduate School in the Southern Pacific Hospital; the school will conduct refresher courses for Texas doctors as well as conduct the residency program.

WEST VIRGINIA

Ophthalmology and Otolaryngology Meeting.—The annual meeting of the West Virginia Academy of Ophthalmology and Otolaryngology will be held at the Greenbrier in White Sulphur Springs April 27-28. Guest speakers will include Dr. Herbert M. Katzin, New York, "Cysts of the Peripheral Retina," and Dr. John M. Converse, New York, "Corrective Surgery of the Nose."

Personals.—Dr. S. Elizabeth McFetridge of Shepherdstown was reelected president of the West Virginia Cancer Society at a meeting in Parkersburg February 18.——Dr. Thomas C. Sims of Fayetteville, health officer for Fayette County, has resigned to become medical director of the regional American Red Cross blood center in Huntington. The region is composed of Ohio, Kentucky and West Virginia. Doctor Sims reported for duty March 1.——Dr. Charles A. Zeller has resigned as superintendent of Weston State Hospital, Weston, W. Va., to accept appointment as head of the psychiatric department of the new veterans hospital at Clarksburg. Dr. Zeller has been superintendent of the Weston State Hospital since May 1949. He is a former medical director of the Governor Bacon Health Center at Delaware City, Del.

GENERAL

Change in Neurology Journal Editorship.—Dr. George B. Hassin, Chicago, has relinquished his duties as chief editor of the *Journal of Neuropathology and Experimental Neurology*, and Dr. Joseph H. Globus, New York, has been appointed to succeed him in that position; the associate editors are Dr. Armando Ferraro and Dr. Arthur Weil.

Societies Change Meeting Place.—The following societies have been forced to move their meeting place from the Greenbrier in White Sulphur Springs, W. Va., to the Claridge Hotel in Atlantic City. The previously announced dates remain the same:

Triological Society, May 6-8.
American Broncho-Esophagological Association, May 7-8.
American Laryngological Association, May 9-10.
American Otological Society, Inc., May 11-12.

New England Council Meeting.—The sixth annual meeting of the Council of New England State Medical Societies will be held at the Copley Plaza Hotel, Boston, April 15. The principal speaker will be Albert N. Jorgensen, LL.D., president of the University of Connecticut at Storrs, whose subject will be "The Present Emergency and Its Impact on Higher Education." Dr. Roland E. McSweeney, Brattleboro, Vt., president of the council, will preside.

Southeastern Surgical Congress.—This congress will be held at the Hollywood Beach Hotel, Hollywood, Fla., April 11-14 under the presidency of Dr. Carl C. Howard, Glasgow, Ky. Among the speakers will be:

John Martin, Chicago, Irradiation of Dermatitis of the Hands.
Joe M. Parker, Oklahoma City, Prevention of Lymphedema of Upper Extremity after Radical Mastectomy.
Paul B. Steele, Pittsburgh, Evaluation of the Metallic S.M.O. Head.
Ralph M. Stuck, Denver, Subdural Hematoma in Infants.
Gershom J. Thompson, Rochester, Minn., Female Urologic Disorders Which Cause Abdominal Pain.

Dr. Elmer L. Henderson, Louisville, Ky., President, American Medical Asscciation, will speak on "1951—Medicine's First Year of Grace."

Resident-Intern Awards.—The second annual Resident-Intern Awards of Merit of the Kansas City Southwest Clinical Society will be given this year for the three best papers submitted by residents and/or interns on work they did in the hospital. The winner of the first award will receive a check for $500 and will be invited to give the winning thesis before the society's annual Fall Clinical Conference, October 1-4. The second prize is $100 and the third, $50. The contest is limited to residents or interns on duty in a hospital in Arkansas, Colorado, Iowa, Kansas, Missouri, Nebraska, and Oklahoma. Applications must be made in writing with the endorsement of the chairman of the resident-intern committee or the superintendent of the hospital and mailed to the executive secretary of the society at 630 Shubert Building, Kansas City 6, by April 15. Papers will be accepted up to and including August 1.

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Annual Meeting on Prevention of Blindness.—The forty-second anniversary conference of the National Society for the Prevention of Blindness will be at the Hotel New Yorker in New York March 28-30. The main session, March 28, will cover the need for more research on the blinding diseases. At this session the society's research chairman, Dr. William L. Benedict of the Mayo Clinic, Rochester, Minn., will preside. Among the subjects to be discussed will be the present status of the drugs pituitary adrenocorticotropic hormone (ACTH) and cortisone in treating eye conditions, progress being made to treat retrolental fibroplasia and the latest developments in the study of glaucoma. On March 29 representatives of medicine and management will discuss the needs and problems of vision programs in industry. During the afternoon session March 30, Col. Victor A. Byrnes, M.C., head of the department of ophthalmology at the School of Aviation Medicine, Randolph Field, Texas, will speak on eye injuries from atomic attack. Dr. Edward J. Stieglitz, of Washington, D. C., will talk on vision of our aging population at a luncheon meeting on Friday.

Smithsonian Display on Sutures.—The Smithsonian Institution has accepted for its Division of Medicine and Public Health a new exhibit on surgical sutures showing some of the newer technics and developments in this field. It was presented by Davis and Geck, Inc., Brooklyn. The new display depicts in full color the story of modern surgical sutures. Stress is placed on the development of the various kinds of sutures from their source through various stages of manufacturing, research and testing and into actual use of the suture in the operating room. A notable feature of the exhibit is a diorama showing the modern operating room in three dimensions. It is in full color, as is the entire display, and every feature of the operating room is accurate in smallest detail, including the miniature patient on the operating room table, scrub nurse, suture nurse, anesthetists, surgeons and operating room equipment.

Railway Surgeons Meeting.—The American Association of Railway Surgeons will hold its annual meeting at the Drake Hotel, Chicago, April 3-5, under the presidency of Dr. John A. Cahill, Dubuque, Iowa. The medical profession is invited. Speakers not affiliated with a railroad include:

Cleveland J. White, M.D., Chicago, Diagnosis and Treatment of Fungus Infections of the Skin and Nails.
Derrick Vail, Chicago, Conditions Affecting Visual Deficiency in Railroad Industry.
George C. Turner, Chicago, Present Status of the Diagnosis and Treatment of Pulmonary Tuberculosis.
David E. Markson, Chicago, Arthritis.
Frank V. Theis, Chicago, Peripheral Vascular Surgery.
John T. Reynolds, Chicago, Role of Surgery in the Treatment of Esophageal Disease.
Raymond W. McNealy, Chicago, Carcinoma of the Breast.
Lloyd A. Gittelson, Chicago, Operating Room Emergencies.
Garrott Allen, Chicago, Irradiation Injuries.
Lindon Seed, Chicago, Radioactive Isotopes in Diagnosis and Therapy with Particular Reference to the Thyroid Gland.
Harold C. Voris, Chicago, Epileptic Equivalents in Railroad Industry.

Exhibits will be shown. The annual dinner will be at the hotel April 4 at 7:30 p. m.

Manual on Multiple Sclerosis.—About 10,000 physicians in this country and abroad have just been sent free of charge a comprehensive medical manual, *Multiple Sclerosis and Its Treatment* by Dr. George A. Schumacher, New York, prepared under the auspices of the National Multiple Sclerosis Society. Dr. Schumacher is professor and chairman of the division of neurology, University of Vermont, College of Medicine, Burlington, and associate professor of clinical medicine (neurology), Cornell University Medical College, New York, as well as member of the society's medical advisory board. The manual includes an analysis of essential criteria involved in diagnosis, as well as a critical review of current forms of therapy for the treatment of multiple sclerosis. It first appeared in THE JOURNAL July 22 to Aug. 5, 1950. Since its inception, the National Multiple Sclerosis Society has supported 11 research projects, including five clinics in medical centers throughout the country. Its prime support comes from membership of about 16,000 located in 48 states and most foreign countries. The society is preparing other manuals on rehabilitation in multiple sclerosis for the guidance of physicians and patients for use in home care. These are expected to be completed within the next few months.

Meeting of Southern Anesthesiologists.—The annual meeting of the Southern Society of Anesthesiologists will be held at the Brown Hotel, Louisville, Ky., April 20-21. The scientific program includes:

Dr. Robert P. Bergner, Louisville, Paraplegia Following Spinal Anesthesia.
Dr. Charles R. Stephen, Durham, N. C., Anesthesia for Infants and Children; The Rebreathing Technique.
Dr. Henry W. Crouch, Jefferson Barracks, Mo., Management of Cardiac Arrest.
Dr. Carl H. Guild, Tulsa, Okla., Problems of Anesthesia in Thoracic Surgery.
Dr. Mary Poe, Memphis, Tenn., Clinical Experiences with Methoxamine as a Vasopressor for Spinal Anesthesia.
Dr. Robert A. Hingson, Baltimore, Organization of a Twenty-Four Hour Service of Obstetrical Anesthesia in a Large Hospital.
Dr. Hayward S. Phillips, Atlanta, Ga., Some Observations on the Clinical Use of Surital.
Dr. Arch S. Russell Jr., Washington, D. C., Clinical Use of Ether Isomers.

Those planning to attend the meeting should make hotel reservations by writing directly to the Manager, Brown Hotel, Louisville, mentioning the southern society meeting.

Section Meeting on Physical Medicine.—The Eastern Section meeting of the American Congress of Physical Medicine will be held at the Nurses' Home, Philadelphia General Hospital, on April 28. The program is as follows:

Max V. Weinstein, Brooklyn, Use of Faradism in Rehabilitation of Hemiplegics.
Herman L. Rudolph, Reading, Pa., Rehabilitation for Hemiplegics in the Home.
Harry H. Rosenthal, New York, Ultrasonics in Clinical Medicine.
Fritz Friedland, Framingham, Mass., Clinical Experiences with Ultrasonic Therapy.
Samuel S. Sverdlik, New York, Multiple Purpose Tank.
Norman E. Titus, Downingtown, Pa., Historical Note: A Correction.
Lieut. Col. Raoul C. Psaki, M.C., Washington, D. C., Diagnosis of Injury to Roots and Branches of the Lumbar Plexus.
Lieut. Col. Richard Dear, M.C., Phoenixville, Pa., Management of Korean Casualties with Physical Medicine.
Irvin Neufeld, New York, Pathogenic Concepts of Fibrositis.
Charles A. Furey, Philadelphia, Reflex Sympathetic Dystrophy: Shoulder-Hand Syndrome.
J. Murl Johnston, Pittsburgh, Rehabilitation of Poliomyelitis.
Stella S. Bradford, Upper Montclair, N. J., General Developmental Exercise in Treatment of Specific Structural Disabilities.
Jacob Meislin, Bedford, Mass., Physical Medicine and Rehabilitation in Psychiatry.
Col. E. M. Smith, M.C., Washington, D. C., Present Needs of Army in Physical Medicine.
Alvin B. C. Knudson, Washington, D. C., Present Needs of the Veterans Administration in Physical Medicine and Rehabilitation.
Temple Fay, Philadelphia, Diagnostic Screening for Cerebral Palsy.
George M. Piersol, Philadelphia, What the Internist May Expect from Physical Medicine.
Emery K. Stoner, Philadelphia, Effects of Microwave Diathermy.
William H. Schmidt, Philadelphia, Treatment of Accessible Malignancy by Electrothermia Measures.

At the banquet in the Penn Sheraton Hotel at 7 p. m., Dr. Hans Kraus, New York, will speak on "Indications for Therapeutic Exercise."

Influenza.—The number of reported cases of influenza for the week ended March 10 was 14,448, as compared with 10,675 for the previous week and 15,921 for the same week last year, according to the Influenza Information Center and the National Institutes of Health. An increased prevalence of respiratory disease in the Chicago area developed beginning about the first of February but now is apparently declining, according to Dr. C. G. Loosli of the University of Chicago and Dr. Albert Milzer of the Michael Reese Hospital, collaborators in the Influenza Study Program. The severity of the illness was, in general, relatively mild, lasting three or four days and characterized by sudden onset, fever, headache, gen-

eral aches and pains and minimal respiratory symptoms. Nine of 30 throat washings yielded influenza viruses, which preliminary tests indicate are influenza A' strain. Serological tests in the University of Chicago and Michael Reese laboratories have shown a rise in antibody titer in a total of 12 of 26 paired specimens against FM-1 strain of influenza A' virus. Two paired serum specimens showed significant rises against the Type B-Lee antigen. From Texas there are reports that influenza A' virus has been isolated, and antibody rises against A' strains in paired serums have been determined in cases of influenza-like disease occurring in Galveston. The outbreak now appears to be waning. An increase in influenza-like disease was noted in Iowa City early in February, and since then a number of cases occurred, all showing antibody rises against the FM-1 strain of influenza A' virus by hemagglutination inhibition. A strain of influenza A' virus from throat washings collected on February 15 from a patient in Stuyvesant Falls, N. Y., is reported by the Regional Laboratory, New York State Health Department. This strain shows a closer relation to strains isolated last year than to the FM-1 strain. The Washington State Department of Health reports the serologic diagnosis of influenza A' in two cases in the Puget Sound area. High prevalence of upper respiratory illness has been general throughout the state for two months. An unusual incidence of respiratory disease has been reported in a school in Washington, D. C. Almost one half of the 134 enrolled children have been infected during the past two weeks. The disease is mild in form. A specific diagnosis of influenza has not yet been made. California reports that about 100 cases of clinical influenza among residents of the Veterans Administration Center in Los Angeles were reported on February 28. There was no reported increase in mortality. Southern California continues to release information indicating a sharp increase in prevalence of acute respiratory influenza-like illness. In Utah an investigation is being made of 265 cases of influenza reported from Davis County for the week ended March 9. The World Health Organization at Geneva reports mild influenza to be widespread in Switzerland, Italy, Trieste and Turkey, with cases also being reported in Portugal and Canada. A new outbreak of the disease is reported in Japan. The disease appears to be type A' everywhere, with some type B in Italy.

MEETINGS

AERO MEDICAL ASSOCIATION, Denver, Colo., May 14-16. Dr. Thomas H. Sutherland, 214 S. State St., Marion, Ohio, Secretary.

ALABAMA, MEDICAL ASSOCIATION OF THE STATE OF, Mobile, April 19-21. Dr. Douglas L. Cannon, 519 Dexter Ave., Montgomery, Secretary.

AMERICAN ACADEMY OF NEUROLOGY, Cavalier Hotel, Virginia Beach, Va., April 11-13. Dr. Joe R. Brown, Mayo Clinic, Rochester, Minn., Secretary.

AMERICAN ASSOCIATION FOR CLEFT PALATE REHABILITATION, Bellevue-Stratford Hotel, Philadelphia, April 27-28. Dr. Robert L. Harding, 813 N. Second Street, Harrisburg, Pa., Chairman.

AMERICAN ASSOCIATION FOR THORACIC SURGERY, Atlantic City, April 16-18. Dr. Brian Blades, 901 Twenty-Third St. N.W., Washington 7, D. C., Secretary.

AMERICAN ASSOCIATION OF GENITO-URINARY SURGEONS, Skytop Lodge, Skytop, Pa., May 16-18. Dr. Norris J. Heckel, 122 S. Michigan Ave., Chicago 3, Secretary.

AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, Atlantic City, N. J., April 23-27. Dr. Edward C. Holmblad, 28 E. Jackson Blvd., Chicago 4, Managing Director.

AMERICAN ASSOCIATION OF PATHOLOGISTS AND BACTERIOLOGISTS, Cleveland, April 26-28. Dr. Alan R. Moritz, 2085 Adelbert Road, Cleveland 6, Secretary.

AMERICAN ASSOCIATION OF RAILWAY SURGEONS, Drake Hotel, Chicago, April 3-5. Dr. Chester C. Guy, 5800 Stony Island Ave., Chicago 37, Secretary.

AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION, Hotel Claridge, Atlantic City, May 7-8. Dr. Edwin N. Broyles, 1100 N. Charles St., Baltimore 1, Secretary.

AMERICAN COLLEGE OF PHYSICIANS, St. Louis, April 9-13. Mr. E. R. Loveland, 4200 Pine St., Philadelphia 4, Executive Secretary.

AMERICAN GYNECOLOGICAL SOCIETY, Waldorf-Astoria Hotel, New York, May 7-9. Dr. Norman F. Miller, 1313 E. Ann St., Ann Arbor, Mich., Secretary.

AMERICAN LARYNGOLOGICAL ASSOCIATION, Hotel Claridge, Atlantic City, May 9-10. Dr. Louis H. Clerf, 1530 Locust St., Philadelphia 2, Secretary.

AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY, Hotel Claridge, Atlantic City, May 6-8. Dr. C. Stewart Nash, 277 Alexander St., Rochester 7, N. Y., Secretary.

AMERICAN OTOLOGICAL SOCIETY, Hotel Claridge, Atlantic City, May 11-12. Dr. John Lindsay, 950 E. 59th St., Chicago 37, Secretary.

AMERICAN PEDIATRIC SOCIETY, Atlantic City, May 2-5. Dr. Henry G. Poncher, 1819 W. Polk St., Chicago 12, Secretary.

AMERICAN PHYSIOLOGICAL SOCIETY, Cleveland, April 30-May 4. Dr. R. W. Gerard, Dept. of Physiology, University of Chicago, Chicago, Secretary.

AMERICAN PSYCHIATRIC ASSOCIATION, Cincinnati, May 7-11. Dr. R. Finley Gayle Jr., 501 E. Franklin St., Richmond 19, Va., Secretary.

AMERICAN PSYCHOSOMATIC SOCIETY, Chalfonte-Haddon Hall, Atlantic City, N. J., April 28. Dr. Sydney G. Margolin, 714 Madison Ave., New York City 21, Secretary.

AMERICAN SOCIETY FOR CLINICAL INVESTIGATION, Steel Pier, Atlantic City, April 30. Dr. Paul B. Beeson, Grady Hospital, Atlanta 3, Ga., Secretary.

AMERICAN SOCIETY FOR EXPERIMENTAL PATHOLOGY, Cleveland, April 30-May 4. Dr. Sidney C. Madden, Brookhaven National Laboratory, Upton, L. I., New York, Secretary.

AMERICAN SOCIETY FOR PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS, Cleveland, April 28-May 4. Dr. Harvey B. Haag, Medical College of Virginia, Richmond 19, Va., Secretary.

AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS, Cleveland, April 28-May 4. Dr. Elmer H. Stotz, University of Rochester School of Medicine, Rochester 7, N. Y., Secretary.

AMERICAN SURGICAL ASSOCIATION, Washington, D. C., April 11-13. Dr. Nathan A. Womack, University Hospitals, Iowa City, Secretary.

ARIZONA MEDICAL ASSOCIATION, Tucson, April 29-May 2. Dr. Frank J. Milloy, 234 North Central Ave., Phoenix, Secretary.

ARKANSAS MEDICAL SOCIETY, Little Rock, April 23-25. Dr. William R. Brooksher, 100 N. 16th St., Fort Smith, Secretary.

ASSOCIATION OF AMERICAN PHYSICIANS, Chalfonte-Haddon Hall, Atlantic City, May 1-2. Dr. Henry M. Thomas Jr., 1201 N. Calvert St., Baltimore 2, Secretary.

CALIFORNIA MEDICAL ASSOCIATION, Los Angeles, May 13-16. Dr. Albert C. Daniels, 450 Sutter St., San Francisco 8, Secretary.

CONNECTICUT STATE MEDICAL SOCIETY, Stratford, May 1-3. Dr. Creighton Barker, 160 St. Ronan St., New Haven, Secretary.

DALLAS SOUTHERN CLINICAL SOCIETY, Hotel Adolphus, Dallas, Texas, March 26-29. Miss Betty Elmer, 433 Medical Arts Bldg., Dallas, Executive Secretary.

FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, Cleveland, April 28-May 4. Dr. Milton O. Lee, 2101 Constitution Ave., Washington 25, D. C., Secretary.

FLORIDA MEDICAL ASSOCIATION, Hollywood Beach Hotel, Hollywood, April 22-25. Dr. Robert B. McIver, P. O. Box 1018, Jacksonville, Secretary.

GEORGIA, MEDICAL ASSOCIATION OF, Bon Air Hotel, Augusta, April 17-20. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.

HAWAII TERRITORIAL MEDICAL ASSOCIATION, Honolulu, May 3-6. Dr. I. L. Tilden, 510 S. Beretania St., Honolulu 13, Secretary.

IOWA STATE MEDICAL SOCIETY, Sioux City, April 23-26. Dr. Allan B. Phillips, 406 Sixth Ave., Des Moines 9, Secretary.

KANSAS MEDICAL SOCIETY, Topeka, May 14-17. Dr. D. D. Vermillion, 512 New England Bldg., Topeka, Secretary.

LOUISIANA STATE MEDICAL SOCIETY, New Orleans, May 7-9. Dr. C. Grenes Cole, 1430 Tulane Ave., New Orleans 12, Secretary.

MARYLAND, MEDICAL AND CHIRURGICAL FACULTY OF THE STATE OF, Baltimore, April 24-25. Dr. George H. Yeager, 1211 Cathedral St., Baltimore 1, Secretary.

MID-CONTINENT PSYCHIATRIC ASSOCIATION, Kansas City, Mo., March 31-April 1. Dr. Paul Hines, 2625 W. Paseo, Kansas City, Mo., Secretary.

MINNESOTA STATE MEDICAL ASSOCIATION, Municipal Auditorium, Rochester, April 30-May 2. Dr. B. B. Souster, 496 Lowry Medical Arts Bldg., St. Paul 2, Secretary.

MISSISSIPPI STATE MEDICAL ASSOCIATION, Biloxi, May 15-17. Dr. T. M. Dye, Box 295, Clarksdale, Secretary.

MISSOURI STATE MEDICAL ASSOCIATION, Municipal Auditorium, Kansas City, April 22-25. Dr. H. E. Petersen, 634 N. Grand Blvd., St. Louis 3, Secretary.

NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS, Hotel New Yorker, New York, March 28-30. Dr. Franklin M. Foote, 1790 Broadway, New York 19, Executive Director.

NATIONAL TUBERCULOSIS ASSOCIATION, Cincinnati, Ohio, May 14-18. Dr. James E. Perkins, 1790 Broadway, New York 19, Managing Director.

NEBRASKA STATE MEDICAL ASSOCIATION, Paxton Hotel, Omaha, April 30-May 3. Dr. R. B. Adams, 1315 Sharp Bldg., Lincoln 8, Secretary.

NEW JERSEY, MEDICAL SOCIETY OF, Haddon Hall, Atlantic City, May 14-17. Dr. Marcus H. Greifinger, 315 W. State St., Trenton 8, Secretary.

NEW MEXICO MEDICAL SOCIETY, Santa Fe, May 3-5. Dr. L. G. Rice Jr., 221 West Central Ave., Albuquerque, Secretary.

NEW YORK, MEDICAL SOCIETY OF THE STATE OF, Hotel Statler, Buffalo, April 30-May 4. Dr. Walter P. Anderton, 292 Madison Ave., New York 17, Secretary.

NORTH CAROLINA, MEDICAL SOCIETY OF THE STATE OF, The Carolina, Pinehurst, May 7-9. Dr. Millard D. Hill, 203 Capitol Club Bldg., Raleigh, Secretary.

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NORTH PACIFIC SOCIETY OF NEUROLOGY AND PSYCHIATRY, Victoria, B. C., Canada, April 20-21. Dr. Gerhard B. Haugen, Mayer Bldg., Portland, Ore., Secretary.

OHIO STATE MEDICAL ASSOCIATION, Netherland Plaza Hotel, Cincinnati, April 24-26. Mr. Charles S. Nelson, 79 E. State St., Columbus 15, Executive Secretary.

RHODE ISLAND MEDICAL SOCIETY, Providence, May 9-10. Dr. Morgan Cutts, 106 Francis St., Providence 3, Secretary.

SECTIONAL MEETINGS, AMERICAN COLLEGE OF SURGEONS:

Portland, Ore., Multnomah Hotel, March 26-27. Dr. Louis P. Gambee, 833 S.W. Eleventh Ave., Portland 5, Chairman.

Denver, Colo., Cosmopolitan Hotel, April 5-7. Dr. Kenneth C. Sawyer, 1820 Gilpin St., Denver 6, Chairman.

Detroit, Mich., Book-Cadillac Hotel, May 9-11. Dr. Eugene A. Osius, 1553 Woodward Ave., Detroit 26, Chairman.

SOCIETY FOR PEDIATRIC RESEARCH, Hotel Traymore, Atlantic City, May 2-3. Dr. Robert Ward, Bellevue Medical Center, New York 16, Secretary.

SOUTH CAROLINA MEDICAL ASSOCIATION, Ocean Forest Hotel, Myrtle Beach, May 15-17. Dr. N. B. Heyward, 105 W. Cheves St., Florence, Secretary.

SOUTHEASTERN SURGICAL CONGRESS, Hollywood Beach Hotel, Hollywood, Fla., April 11-14. Dr. Benjamin T. Beasley, 45 Edgewood Ave. S.E., Atlanta 3, Ga., Secretary.

SOUTHERN SOCIETY OF ANESTHESIOLOGISTS, Brown Hotel, Louisville, Ky., April 20-21. Dr. John Adriani, Charity Hospital, New Orleans 12, Secretary.

SOUTHWEST ALLERGY FORUM, San Antonio, Texas, April 8-10. Dr. Boen Swinney, 224 Medical Arts Bldg., San Antonio 5, Secretary.

TENNESSEE STATE MEDICAL ASSOCIATION, Nashville, April 9-11. Mr. V. O. Foster, 706 Church St., Nashville 3, Executive Secretary.

TEXAS, STATE MEDICAL ASSOCIATION OF, Galveston, April 28-May 2. Mr. Tod Bates, 700 Guadalupe St., Austin, Executive Secretary.

UNITED STATES-MEXICO BORDER PUBLIC HEALTH ASSOCIATION, Los Angeles, April 4-6. Dr. M. F. Haralson, 314 U. S. Court House, El Paso, Texas, Secretary.

INTERNATIONAL

EUROPEAN CONGRESS ON RHEUMATISM, Barcelona, Spain, Sept. 24-27. Dr. Gunnar Edström, Lund, Sweden, Secretary.

INTERNATIONAL ANESTHESIA RESEARCH SOCIETY, London, England, Sept. 3-7. Mr. R. W. Cope, University College Hospital, London W.C.1, England.

INTERNATIONAL ASSOCIATION OF ALLERGISTS, Zurich, Switzerland, Sept. 23-29. Prof. A. S. Grumbach, Hygiene Institut der Universitaet Zurich, Gloriastr. 32, Zurich, Switzerland.

INTERNATIONAL CONGRESS OF ANESTHESIOLOGY, Nursing School of the Salpiettre, 47 Boul de l'Hospital, Paris, France, Sept 20-22. 12 rue de Seine, Paris 6e, France, Secretariat.

INTERNATIONAL CONGRESS OF CLINICAL PATHOLOGY, London, England, July 16-20. Dr. W. H. McMenemey, Maida Vale Hospital for Nervous Diseases, London W.9, England, Secretary.

INTERNATIONAL CONGRESS OF GYNECOLOGY, Maison de la Chimie, Centre Marcellin, Paris, France, June 23-29. Dr. Maurice Fabre, 1, rue Jules-Lefebvre, Paris IX, General Secretary.

INTERNATIONAL CONGRESS ON MENTAL HEALTH, Mexico City, Mexico, Dec. 14-22.

INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY, Paris, France, June 17-23. Physician General Dutrey, 8, bis, rue de Recollets, Paris X, Secretary General.

INTERNATIONAL CONGRESS OF ORTHOPEDIC SURGERY AND TRAUMATOLOGY, Stockholm, Sweden, May 21-25. Sten Friberg, Karolinska Instituts Ortopediska Klinik, Stockholm, Congress Secretariat.

INTERNATIONAL EXHIBITION OF MEDICAL ARTS, Turin, Italy, May 30-June 21. Prof. S. Teneff, Palazzo della Esposizioni al Valentino, Turino, Italy.

INTERNATIONAL GERONTOLOGICAL CONGRESS, Hotel Jefferson, St. Louis, Mo., U. S. A., Sept. 9-14. Dr. John E. Kirk, 5600 Arsenal Street, St. Louis 9, Mo., Chairman, Program Committee.

INTERNATIONAL HOSPITAL CONGRESS, Brussels, Belgium, July 15-21. Capt. J. E. Stone, 10 Old Jewry, London E.C., England, Secretary.

INTERNATIONAL POLIOMYELITIS CONGRESS, Copenhagen, Denmark, Sept. 3-7. Prof. Dr. Niels Bohr, Statens Seruminstitut, 80 Amager Blvd., Copenhagen S., Denmark, President.

INTERNATIONAL SOCIETY OF SURGERY, Paris, France, Sept. 24-29. Dr. L. Dejardin, 141, rue Belliard, Brussels, Belgium, Secretary General.

INTERNATIONAL SOCIETY FOR THE WELFARE OF CRIPPLES, Fifth World Congress, Stockholm, Sweden, Sept. 9-14. Mr. Donald V. Wilson, 54 E. 64th St., New York 21, N. Y., U. S. A., Executive Director.

PAN AMERICAN CONGRESS ON MEDICAL EDUCATION, Lima, Peru, May 14-18. Dr. Carlos F. Krumdieck, Washington 914, Lima, Secretary General.

PAN PACIFIC SURGICAL ASSOCIATION CONGRESS, Honolulu, Hawaii, Nov. 10-21. Dr. Forrest J. Pinkerton, Suite 7, Young Bldg., Honolulu, Hawaii, President.

WORLD CONFEDERATION FOR PHYSICIAL THERAPY, Copenhagen, Denmark, Sept. 7-8.

WORLD MEDICAL ASSOCIATION, Stockholm, Sweden, Sept. 15-21. Dr. Louis H. Bauer, 2 E. 103d St., New York 29, N. Y., U. S. A., Secretary-General.

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* Various Centers. April 16-17 (Part II only), June 18-20, Sept. 5-7. Ex. Sec., Mr. E. S. Elwood, 225 S. 15th Street, Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written.* July 20. Given simultaneously in several cities in the United States. Final date for filing application was Jan. 20. *Oral.* Coronado, Calif., April 4-7 and Memphis, Oct. 14-17. Sec., Dr. Curtiss B. Hickcox, 80 Seymour St., Hartford 15, Conn.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written.* Various Centers, April 5. *Oral.* New York, June 8-10. Sec., Dr. George M. Lewis, 66 East 66th St., New York 21, N. Y.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Various centers, Oct. 15. Final date for filing applications is May 1. *Oral.* The schedule of oral examinations for 1951 has been arranged on a regional basis as follows: St. Louis, April 4-6 or 5-7, includes candidates from Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota and Wisconsin. Philadelphia, June, covering Beirut, Canada, Canal Zone, Connecticut, Delaware, District of Columbia, Maryland, New Jersey, Ohio, Pennsylvania, Puerto Rico, Rhode Island, Virginia and West Virginia. New York, date to be announced, covering Maine, Massachusetts, New Hampshire, New York and Vermont. San Francisco, date to be announced, Arizona, California, Colorado, Idaho, Montana, New Mexico, Oregon, Utah and Washington.

Only candidates who have not taken an oral examination can be admitted under the schedule arranged thus far.

The final date for the filing of applications for the Philadelphia examination was March 1. Dates of closing dates for the filing of applications for examinations in New York and San Francisco to be announced.

Oral examinations in the subspecialties will be held at the same time and place and on the same distribution.

Exec. Sec., Dr. William A. Werrell, 1 West Main Street, Madison 3.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: *Oral.* Chicago, May 1951. Sec., Dr. W. J. German, 789 Howard Ave., New Haven 4, Conn.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Oral.* New York City, May 10-16. Final date for filing application was Feb. 2. Sec., Dr. Paul Titus, 1015 Highland Building, Pittsburgh 6, Pa.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral.* New York, May 31-June 5; Chicago, October 8-13. Sec., Dr. Edwin B. Dunphy, 56 Ivie Road, Cape Cottage, Maine.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral.* Richmond, Va., May 1-4, Chicago, Oct. 9-12. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City.

AMERICAN BOARD OF PATHOLOGY: *Written and Oral. Pathological Anatomy and Clinical Pathology.* Cleveland, April 23-24. Final date for filing application was March 15. Sec., Dr. Robert A. Moore, Washington University School of Medicine, Euclid Ave. & Kingshighway, St. Louis 10.

AMERICAN BOARD OF PEDIATRICS: *Oral.* Cincinnati, March 30-April 1; Atlantic City, May 5-7. Ex. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

AMERICAN BOARD OF PHYSICAL MEDICINE AND REHABILITATION: *Parts I and II.* Philadelphia, June 16-17. Final date for filing application is April 1. Sec., Dr. Robert L. Bennett, 30 N. Michigan Ave., Chicago.

AMERICAN BOARD OF PLASTIC SURGERY: *Oral and Written.* Chicago, June 4-6. Final date for filing application is March 15. Sec., Dr. Bradford Cannon, 330 Dartmouth St., Boston.

AMERICAN BOARD OF PREVENTIVE MEDICINE AND PUBLIC HEALTH. Biloxi, Miss., April 24-25. Sec., Dr. Ernest L. Stebbins, 615 N. Wolfe St., Baltimore.

AMERICAN BOARD OF PROCTOLOGY: *Part I in Anorectal Surgery and Proctology.* Kansas City, Minneapolis, Philadelphia and San Francisco, May 12. Sec.-Gen., Dr. Louis A. Buie, 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Philadelphia, June 11-12. Final date for filing application was March 1. Sec., Dr. Francis J. Braceland, 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: *Oral.* Atlantic City, June 5-9. Sec., Dr. B. R. Kirklin, 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written.* Various centers, Oct. 1951. Final date for filing applications is July 1. Sec., Dr. J. Stewart Rodman, 225 South 15th Street, Philadelphia.

BOARD OF THORACIC SURGERY: *Oral.* New York City, April 19. Sec., Dr. William M. Tuttle, 1151 Taylor Ave., Detroit.

AMERICAN BOARD OF UROLOGY: Chicago, Feb. 9-13, 1952. Final date for filing applications is Sept. 1. Sec., Dr. Harry Culver, 314 Corn Exchange Bldg., Minneapolis 15.

DEATHS

Neymann, Clarence Adolph ⊕ Chicago; born in Chicago, Nov. 7, 1887; Universität Heidelberg Medizinische Fakultät, Baden, Germany, 1914; assistant professor of psychiatry at Rush Medical College from 1919 to 1921; associate professor of psychiatry at Northwestern University Medical School from 1921 to 1948, when he became professor, and in the same year served as a member of the university senate; formerly honorary professor of medicine at the National University of Mexico and exchange professor of the Belgian American Educational Foundation to the universities of Ghent, Louvain, Liège and Brussels in 1935; decorated officer Belgian Order de la Couronne; member of the Belgian League of Honor; fellow of the Royal Society of Medicine, American Academy of Physical Medicine and the American Psychiatric Association; member of the American Psychopathological Society, Central Neuro-Psychiatric Association, Chicago Institute of Medicine, Chicago Medical Society, Chicago Society of Medical History, Chicago Society for Personality Study, Chicago Academy of Criminology, Chicago Pathological Society, Society of Harvard Chemists, Johns Hopkins Medical Society and Phi Chi and Phi Kappa Epsilon; past president of the Illinois Psychiatric Society and Chicago Neurological Society; honorary member of the Indian Psychiatric Society, Société de Médicine Mentale de Belgique and Yucatan Medical Society; specialist certified by the American Board of Psychiatry and Neurology; instructor of psychiatry, Phipps Clinic, Johns Hopkins Hospital in Baltimore from 1915 to 1918 and director of the laboratory of internal medicine; superintendent of the Cook County Psychopathic Hospital from 1919 to 1922 and later chief of staff; consultant in neuropsychiatry at the Illinois Charitable Eye, Ear Infirmary, Veterans Rehabilitation Center and Wesley Memorial Hospital; in 1946 received a degree in medicine, honoris causa, from the University of Ghent; contributor to Rosanoff's "Manual of Psychiatry," Pemberton, Mock and Coulter's "Principles and Practice of Physical Therapy" and Goldberg's "Clinical Tuberculosis"; author of "Artificial Fever Produced by Physical Means, Its Development and Application" (1937); author, under the pseudonyms of Clarence Sheraton and Jan Van Hoff, of a series of magazine articles; died suddenly in St. Petersburg, Fla., January 11, aged 63, of bronchopneumonia.

Harris, Robert Peter, Knoxville, Tenn.; born in Chicago Jan. 21, 1886; College of Physicians and Surgeons, Little Rock, Ark., 1911; member of the American Medical Association and the Arkansas Medical Society; served during World War I; affiliated with Eastern State Hospital; formerly passed assistant surgeon in the U. S. Public Health Service reserve; at one time associated with the U. S. Veterans Bureau in Little Rock, Springfield State Hospital in Sykesville, Md., Austin State Hospital in Austin, Texas, Central State Hospital in Nashville, Tenn.; formerly physician for the Ringling Brothers' Circus in Sarasota, Fla.; died December 23, aged 64, of acute myocarditis.

Naylor, James Henry, Hartford, Conn.; born in 1869; University of Vermont College of Medicine, Burlington, 1895; member of the American Medical Association; for many years member of the school board; served as trustee of the Mansfield State Training School and Hospital in Mansfield and as commissioner of the Norwich (Conn.) State Hospital; in 1929 organized and became president of the South End Bank and Trust Company; in 1945 received an honorary degree of Doctor of Laws from the University of Vermont in Burlington; died in Hartford Hospital December 25, aged 81, of metastatic carcinoma of the left kidney.

Mabey, J. Corwin ⊕ Montclair, N. J.; born in Montclair in 1873; Columbia University College of Physicians and Surgeons, New York, 1905; an Associate Fellow of the American Medical Association; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; for many years on the staff of the Mountainside Hospital; affiliated with Essex County Hospital for Contagious Diseases, Belleville, Essex County Overbrook Hospital in Cedar Grove, and Essex Mountain Sanatorium in Verona; died December 17, aged 77, of pulmonary and myocardial infarction and arteriosclerosis.

Wales, Ernest de Wolfe ⊕ Indianapolis; born in Braintree, Mass., 1873; Harvard Medical School, Boston, 1899; at one time on the faculties of the Indiana University School of Medicine in Indianapolis and Harvard Medical School in Boston, where he was on the staffs of Massachusetts General Hospital and Massachusetts Charitable Eye and Ear Infirmary; specialist certified by the American Board of Otolaryngology; member of the American Laryngological, Rhinological and Otological Society; an Associate Fellow of the American Medical Association; died in Methodist Hospital December 11, aged 77, of coronary occlusion.

Buschke, William H., Flushing, N. Y.; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1932; member of the American Medical Association, American Psychological Society, Association for Research in Ophthalmology and the New York Academy of Sciences; specialist certified by the American Board of Ophthalmology; formerly on the faculty of Johns Hopkins University School of Medicine, Baltimore; affiliated with the Manhattan Eye, Ear and Throat Hospital in New York as research director of the Ayer Ophthalmic Laboratory, where he died December 21, aged 43, of heart disease.

Lynch, Otho Rees, Peru, Ind.; born in Miami County, Ind., March 30, 1880; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1906; member of the American Medical Association and the American Psychiatric Association; served during World War I; formerly medical director of the Wabash Valley Sanitarium in Lafayette and superintendent of the Logansport State Hospital, Logansport; at one time associated with the Veterans Administration; died in Veterans Administration Hospital, Indianapolis, December 25, aged 70, of atelectasis and bronchopneumonia.

Vose, Royden Mandeville ⊕ Ithaca, N. Y.; Cornell University Medical College, New York, 1902; member of the Association of Military Surgeons of the United States and the American Association of Industrial Physicians and Surgeons; served during World War I and was decorated with Verdun Medal and the Order of the Purple Heart; affiliated with Cornell University Infirmary and Tompkins County Memorial Hospital; a charter member of the board of directors of the Ithaca Savings and Loan Association; died December 19, aged 71, of cerebral hemorrhage.

Aaron, William Hubert, Pawhuska, Okla.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; member of the American Medical Association; for many years county health commissioner; was cited for meritorious service during World War I; during World War II medical examiner for the draft board and received commendation from the President; at one time associated with the Indian Service; on the staff of Pawhuska Municipal Hospital; died in Highland Park, Ill., December 9, aged 76.

Anderson, Johnson Rose ⊕ Shreveport, La.; University of Texas School of Medicine, Galveston, 1918; specialist certified by the American Board of Radiology; member of the American Roentgen Ray Society and the American College of Radiology; formerly affiliated with North Louisiana Sanitarium; associated with the Veterans Administration since 1947; died in the Veterans Administration Hospital December 15, aged 59, of coronary occlusion.

⊕ Indicates Fellow of the American Medical Association.

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Austin, Orrin Oscar ⊕ Harperville, Miss.; Atlanta Medical College, 1914; served during World War I; died December 27, aged 66.

Barone, Joseph ⊕ Boston; Tufts College Medical School, Boston, 1911; member of the New England Obstetrical and Gynecological Society; affiliated with Bellevue Hospital in Brookline; died December 26, aged 64.

Burn, John Walter, Charleston, S. C.; Medical College of the State of South Carolina, Charleston, 1903; member of the American Medical Association; formerly vice president of the South Carolina Medical Association; physician for the city school board; on the staff of Roper Hospital; died December 23, aged 78, of injuries received when he was struck by an automobile.

Cates, William Richard, Ackerly, Texas; Memphis (Tenn.) Hospital Medical College, 1904; died in Big Spring recently, aged 81, of cerebral hemorrhage and arteriosclerotic heart disease.

Charon, Ernest Amable ⊕ East Providence, R. I.; School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval, 1894; served as health officer of the town of Lincoln; died in St. Joseph's Hospital, Providence, December 9, aged 82, of cerebral thrombosis.

Chasse, Leo Roland, Manchester, N. H.; Laval University Faculty of Medicine, Quebec, Canada, 1941; member of the American Medical Association; served overseas during World War II; on the staff of Notre Dame Hospital, where he died December 15, aged 37, of peritonitis, acute appendicitis and acute diverticulitis.

Childers, David Marion, Lufkin, Texas; Kentucky School of Medicine, Louisville, 1892; member of the American Medical Association; died in Houston recently, aged 83, of congestive heart failure.

Dingmann, Albert ⊕ New York; Julius-Maximilians-Universität Medizinische Fakultät, Würzburg, Bavaria, Germany, 1922; affiliated with Mount Sinai Hospital; died in Flower and Fifth Avenue Hospitals recently, aged 51, of heart disease.

Driscoll, William Thomas, Norwich, Conn.; College of Physicians and Surgeons, Baltimore, 1912; member of the American Medical Association and the New England Pediatric Society; on the staff of the William W. Backus Hospital; died recently, aged 64, of coronary thrombosis.

Drought, Warren Wesley, Fergus Falls, Minn.; University of Minnesota College of Homeopathic Medicine and Surgery, Minneapolis, 1891; member of the American Medical Association; died recently, aged 88, of cardiovascular disease.

Earl, Guy Leo, Cottage Grove, Ore.; Creighton University School of Medicine, Omaha, 1932; served during World War II; died recently, aged 54, of myocardial infarct.

Empson, Roy George ⊕ Valmeyer, Ill.; Washington University School of Medicine, St. Louis, 1912; on the courtesy staff of St. Clement's Hospital in Red Bud; died December 16, aged 65, of coronary occlusion.

Flanagan, Andrew, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1912; on the courtesy staff of Memorial Hospital, where he died December 29, aged 60, of injuries received in an automobile accident.

Foulk, George Robinson, Wilmington, Del.; Hahnemann Medical College and Hospital of Philadelphia, 1902; served on the staff of Memorial Hospital; at one time city physician; died December 31, aged 76, of coronary occlusion and hypertensive cardiovascular disease.

Fowlkes, William Burton, Danville, Va.; Medical College of Virginia, Richmond, 1914; served during World War I; died in the Veterans Administration Hospital, Richmond, December 4, aged 64, of brain tumor.

Frohock, Horatio Wilbur, Rockland, Maine; College of Physicians and Surgeons, Boston, 1907; member of the American Medical Association; served during World War I; on the staff of the Knox County General Hospital, where he died December 29, aged 68, of cardiac failure.

Gallion, William Edwin Jr., Darlington, Md.; University of Maryland School of Medicine, Baltimore, 1912; was a member of the American Medical Association; died recently, aged 64, of coronary thrombosis.

Ganoe, James Orval ⊕ Ogden, Iowa; Omaha Medical College, 1897; died in Boone recently, aged 82, of cardiorenal disease and acute cholecystitis.

Gardner, J. Harry, Pikesville, Md.; Baltimore Medical College, 1892; died recently, aged 88, of arteriosclerosis.

Giuffrida, Francis Joseph, Atlanta, Ga.; Atlanta School of Medicine, 1910; served during World War I; on the staffs of the Grady, St. Joseph's and the Crawford W. Long Memorial hospitals; died December 21, aged 70, of adenocarcinoma of the rectosigmoid.

Gleason, Michael, Mendota, Ill.; Creighton University School of Medicine, Omaha, 1927; member of the American Medical Association and the American Trudeau Society; served during World War II; on the staff of St. Mary's Hospital in La Salle; died December 25, aged 49, of coronary occlusion.

Goodson, Marcus, New York; New York University Medical College, New York, 1896; died recently, aged 84, of pulmonary tuberculosis and arteriosclerosis.

Higgins, Otis C., Lebanon, Ind.; Chicago Homeopathic Medical College, 1900; Rush Medical College, Chicago, 1900; for many years served as city and county health officer; member of the American Medical Association; died December 26, aged 74, of coronary occlusion and diabetes mellitus.

Humphrey, Hall H. ⊕ Daykin, Neb.; Lincoln Medical College of Cotner University, 1913; served as president of the Jefferson County Medical Association and vice president of the Nebraska State Medical Association; past president of the school board and Jefferson County Bank; affiliated with Lincoln (Neb.) General Hospital; died December 21, aged 62.

Jackson, Rice Robinson ⊕ Dallas, Texas; Jefferson Medical College of Philadelphia, 1905; died December 7, aged 73, of myocardial infarction and hypertension.

Jacoby, Myron David, Detroit; Syracuse University College of Medicine, 1923; member of the American Medical Association; specialist certified by the American Board of Pediatrics; on the staff of Grace Hospital, where he died November 20, aged 50, of dissecting aneurysm of the aorta.

Janes, Arthur Percy ⊕ Boston; Tufts College Medical School, Boston, 1905; died in Cushing Veterans Administration Hospital, Framingham, December 30, aged 71, of pneumonia.

Janes, Vincil Baley, Cameron, Mo.; Barnes Medical College, St. Louis, 1897; served during World War I; surgeon, Rock Island and Chicago, Burlington and Quincy railroads; died December 23, aged 81, of carcinoma of the prostate.

Jennings, George John, Beacon, N. Y.; Albany Medical College, 1904; member of the American Medical Association; died recently, aged 75, of carcinoma of the prostate with metastases.

Johnson, Bruce Campbell, Kalispell, Mont.; University of Texas School of Medicine, Galveston, 1949; interned at Jefferson Davis Hospital, Houston, Texas; resident, Robert B. Green Memorial Hospital in San Antonio, Texas; died in San Antonio recently, aged 27, of bulbar poliomyelitis.

Jones, Martin Darwin ⊕ Oak Park, Ill.; Rush Medical College, Chicago, 1899; also a graduate in pharmacy; fellow of the American College of Surgeons; past president of the Aux Plaines Branch of the Chicago Medical Society; served as chairman of the surgical staff and as a member of the board of trustees of West Suburban Hospital, where he died December 29, aged 80, of coronary thrombosis.

Kenyon, Howard Marion, Schaghticoke, N. Y.; Albany Medical College, 1917; member of the American Medical Association; health officer of the town of Easton; on the staff of Leonard Hospital in Troy; died December 17, aged 59, of heart failure.

Kern, Beverly Franklin, Platteville, Colo.; Denver and Gross College of Medicine, 1907; member of the American Medical Association; served as a member of the school board and as director of the Platteville National Bank; died in Phoenix, Ariz., recently, aged 66, of cerebral hemorrhage and hypertensive cardiovascular disease.

Kirch, Archibald Rowland ✙ Williamsport, Pa.; Wayne University College of Medicine, Detroit, 1921; served during World War I; on the courtesy staff of Williamsport Hospital; died December 10, aged 55, of coronary thrombosis.

Kraft, Clifton D., Parkersburg, W. Va.; Hospital College of Medicine, Louisville, 1907; member of the American Medical Association; died recently, aged 70, of arteriosclerotic heart disease.

Kugler, Frank Elbert, Cincinnati; Medical College of Ohio, Cincinnati, 1894; member of the American Medical Association; for many years physician for the board of health of Cincinnati; died January 3, aged 86, of arteriosclerosis and uremia.

Lake, John Franklin, Dover, Ohio; McGill University Faculty of Medicine, Montreal, Que., Canada, 1938; member of the American Medical Association; county coroner; died December 20, aged 40.

Longfellow, Austin Harris, Machias, Maine; Jefferson Medical College of Philadelphia, 1889; died recently, aged 83, of coronary occlusion.

McCarl, J. Jay, Sac City, Iowa; John A. Creighton Medical College, Omaha, 1907; member of the American Medical Association; died in Loring Hospital November 28, aged 70, of carcinoma of the prostate.

Marsden, Thomas Henry, Fennimore, Wis.; Northwestern University Medical School, Chicago, 1897; died in Madison December 17, aged 78, of arteriosclerosis and carcinoma of the prostate.

Meek, Gaines M., West Chester, Ohio; Tennessee Medical College, Knoxville, Tenn., 1892; died in December, aged 85.

Meyers, Henry Albert ✙ Davenport, Iowa; St. Louis University School of Medicine, 1915; for many years secretary of the Scott County Medical Society; formerly city physician; served on the staffs of Mercy and St. Luke's hospitals; died December 27, aged 61, of coronary occlusion.

Miller, Philip Robert ✙ Brooklyn; Johns Hopkins University School of Medicine, Baltimore, 1928; specialist certified by the American Board of Pediatrics; fellow of the American Academy of Pediatrics and the New York Academy of Medicine; served on the staff of the Jewish Hospital in Brooklyn; died December 23, aged 47, of arteriosclerosis.

Morrow, Frank Henry ✙ Columbus, Neb.; University of Nebraska College of Medicine, Omaha, 1908; fellow of the American College of Surgeons; served during World War I; on the staffs of St. Mary's and Lutheran hospitals; vice president of the Central National Bank; died December 9, aged 70, of pulmonary embolism.

Murray, Robert Vincent ✙ Austin, Texas; University of Texas School of Medicine, Galveston, 1911; served as assistant health officer of Austin; died December 25, aged 61, of nephritis.

Parks, Walter Samuel ✙ Breckenridge, Texas; University of Texas School of Medicine, Galveston, 1923; died in Abilene December 23, aged 61.

Parrott, Reezin L., Zwolle, La.; Memphis (Tenn.) Hospital Medical College, 1903; member of the American Medical Association; died December 17, aged 75.

Paternostro, Francis Harry ✙ Williamsport, Pa.; Temple University School of Medicine, Philadelphia, 1930; on the staff of Williamsport Hospital; died December 11, aged 48, of coronary thrombosis.

Pease, Bert Charles, Lincoln, Neb.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1905; died December 19, aged 70.

Powell, Charles Austin ✙ Brookline, Mass.; Boston University School of Medicine, 1913; served as assistant professor of tropical diseases at his alma mater; formerly a medical missionary in China; for many years asisstant administrator at the Massachusetts Memorial Hospitals; author of "Bound Feet"; died December 28, aged 63, of heart disease.

Pratt, George Peyton, Omaha; Rush Medical College, Chicago, 1913; member of the American Medical Association; fellow of the American College of Physicians; specialist certified by the American Board of Internal Medicine; professor emeritus of clinical medicine at the University of Nebraska College of Medicine; served during World War I; on the staffs of Methodist Hospital and Immanuel Hospital, where he died December 19, aged 62, of hypertension.

Puffer, Maurice Lyon, Downers Grove, Ill.; the Hahnemann Medical College and Hospital, Chicago, 1907; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1909; member of the American Medical Association; veteran of the Spanish-American War and World War I; died in St. Charles Hospital, Aurora, December 29, aged 78, following an operation for ruptured gallbladder.

Riche, Edwin Jules, Redondo Beach, Calif.; Medical Department of Tulane University of Louisiana, New Orleans, 1905; died in Centinela Hospital, Inglewood, December 21, aged 69, of cerebral thrombosis and cerebral arteriosclerosis.

Riddle, Roscoe Conklin, Benton Harbor, Mich.; Meharry Medical College, Nashville, Tenn., 1918; on the staffs of St. Joseph Hospital and Mercy Hospital, where he died December 23, aged 58, of coronary thrombosis.

Robbins, Felicia A., New York; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1899; died in the Madison Avenue Hospital December 16, aged 80.

Roundtree, Walter, Summit, Ga.; University of Georgia School of Medicine, Augusta, 1899; died December 30, aged 78, of bronchopneumonia.

Shrieves, Elizabeth R., Wilmington, Ohio; Laura Memorial Woman's Medical College, Cincinnati, 1899; served on the board of education; died December 24, aged 86, of uremia.

Sobul, Solomon Arthur ✙ Cleveland; Western Reserve University School of Medicine, Cleveland, 1917; examining physician for draft board number 17 during World War II; on the staff of Polyclinic Hospital; died December 27, aged 59.

Thomas, John Donoclift, Boston; College of Physicians and Surgeons, Boston, 1929; Université de Lausanne Faculté de Médecine, Switzerland, 1934; member of the American Medical Association; died December 4, aged 58, of coronary occlusion.

Thompson, Nathan Lincoln ✙ Everett, Wash.; born April 28, 1872; Northwestern University Medical School, Chicago, 1904; fellow of the American College of Surgeons; an Associate Fellow of the American Medical Association; member of the staff of Providence Hospital and head of the department of obstetrics, Everett General Hospital; served as president of the Washington State Medical Association; died in Clermont, Fla., December 21, aged 78, of cerebral hemorrhage and arteriosclerosis.

Thompson, Solomon Henry, Kansas City, Kan.; Howard University College of Medicine, Washington, D. C., 1892; member of the American Medical Association; affiliated with Douglass Hospital, where he died December 11, aged 80.

Trainum, Julian Earl, Richmond, Va.; Medical College of Virginia, Richmond, 1927; died December 22, aged 52, of probable cerebral hemorrhage and diabetic acidosis.

Tudury, Ralph A., New Orleans; Medical Department of Tulane University of Louisiana, New Orleans, 1893; for many years served as physician for the city board of health and the Orleans Parish school board; died in Charity Hospital December 20, aged 79.

Walker, William Henry, Willows, Calif.; Rush Medical College, Chicago, 1900; died December 14, aged 80, of cerebral arteriosclerosis.

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GOVERNMENT SERVICES

ARMY

Selections in Military Intern Program.—Appointment of 132 senior medical students for the military intern program of the Army Medical Service was announced March 6 by Major Gen. R. W. Bliss, Army Surgeon General. This program provides that medical students can, on graduation, be commissioned in the Medical Corps Reserve and serve their internship in an Army hospital with the pay and allowance of a first lieutenant. For the first time since World War II there is now a requirement that the new physicians serve one year on active duty in addition to their year of internship. Selections are made on a competitive basis from senior students in the medical schools. This year 518 applications were received, and appointments were divided between 52 schools. An additional 60 internships in Army hospitals are available to applicants for the Air Force. The dean of medicine or the professor of military science and tactics at the 52 medical schools will tender commissions and active duty orders to the successful applicants on graduation day. Assignment of the new interns to Army hospitals will be as follows: Walter Reed, Washington, D. C., 20; Brooke, Fort Sam Houston, Tex., 26; Madigan, Fort Lewis, Wash., 18; Fitzsimons, Denver, 15; Letterman, San Francisco, 15; Tripler, Honolulu, Hawaii, 14; William Beaumont, Fort Bliss, Tex., 10; Murphy, Waltham, Mass., 5; Valley Forge, Phoenixville, Pa., 3; Percy Jones, Battle Creek, Mich., 3, and Army and Navy, Hot Springs, Ark., 3.

Military internships have proved to be the greatest source of procurement of medical officers for the regular Army. At the end of eight months of internship all those who have demonstrated their capability and aptitude for a career in military medicine are given an opportunity to submit applications for appointment in the regular Army. Of the 132 new medical appointees, 37 currently hold reserve commissions in other arms of the service, some as high as the grade of major. All start their internships as first lieutenants in the Medical Corps Reserve.

SECRETARY OF DEFENSE

Medical Officers Who Desire Transfer.—Officers of the military medical services, regular and reserve, who wish to apply for transfer from one military service to another should submit requests at the earliest possible date. Authority for such transfers, provided by Public Law 779, Eighty-First Congress, expires July 9. Transfers will not be made except on the individual officer's request and with the approval of both military departments concerned. Personnel transferred will be credited with federal service already performed, for purposes of promotion, seniority and retirement, and unused leave may be transferred without loss.

The following military publications govern the submission and processing of applications for transfer:

ARMY.—Active Duty Personnel—Section I, DA Circulars 70 and 71, 1950. Inactive duty personnel—Section II, DA Circular 71, 1950.

NAVY.—Active and Inactive Duty Personnel—Circular Letter 196-50, Navy Medical Bulletin, dated December 15, 1950, Pers-B 6221-NG, P16-3/00, December 15, 1950.

AIR FORCE.—Active Duty Personnel—Air Force Letter No. 36-44, December 13, 1950. Inactive Duty Personnel—Air Force Manual 36-5, December 1950.

Less Paper Work.—The Department of Defense Armed Forces Medical Policy Council has announced standardization of three medical report forms which will give a clearer picture of the need, availability and utilization of medical facilities in the Army, Navy and Air Force. The three forms will replace 10 major reports and a large number of lesser reports and are prescribed for use in all military medical installations by June 1951. The forms standardized are: (1) the "Morbidity Report," which will serve as an aid in analyzing the health of the armed forces, as an indicator of disease trends and an aid in mobilizing preventive medical effort, (2) the "Bed and Patient Report," which will indicate the extent to which military medical facilities are being utilized and provide data for determining the need for expansion or cutbacks in bed capacity, as well as the effectiveness of joint utilization of facilities, and (3) the "Outpatient Report," which supplies information on the type of treatments rendered, the classification of personnel receiving treatment and the number and kind of immunizations provided.

Standardization of these forms followed an agreement on standard definitions, the data required to be reported, and the methods and times of reporting. Reporting dates are not the same for each military service, but the uniform reports will supply comparable data for comparable time periods.

PUBLIC HEALTH SERVICE

Grants to Citizens of Foreign Countries.—The Public Health Service is offering to qualified citizens of other countries a number of training grants in public health and medicine. The grants are part of the United States program for international cooperation in social and economic development. The training will be under the direction of the Division of International Health of the Public Health Service. Foreign physicians, nurses, dentists, engineers and other public health workers with full time positions in their fields who have assurance of returning to their posts or to even more responsible positions are eligible. Applicants will be recommended by committees to be established in each country. The training for physicians offers opportunities in a number of phases of medicine, including the following: teaching basic medical sciences in medical schools or teaching in schools of public health, public health administration, hospital administration, industrial hygiene, maternal and child health, medical nutrition; epidemiology; the control of malaria, tuberculosis, venereal disease; and mental hygiene.

The majority of the training grants are for one year of advanced study in the United States plus a short period of observation in a selected field. The monetary allowances provided are in three categories. Type A grants provide travel, tuition, and a stipend but do not necessarily cover all expenses. Type B grants are those for which expenses are met by the applicant's own government or other sponsor or by the applicant himself. Type C grants are those for which part of the travel or training expense is met by the trainee or some other source. Candidates for training during the 1951-52 school year should submit their applications by April 1, 1951.

Overcrowding in Mental Hospitals.—A report compiled by the National Institute of Mental Health shows that 84 state institutions had 101,005 resident patients under their care at the end of 1948; also covered in the report were 19,799 epilepsy patients under care in state institutions. These totals were 2.3 per cent higher than those for the previous year. Estimates by state authorities, the report states, indicate that the institutions were overcrowded by almost 15 per cent. Overcrowding was reported by 27 states, the highest rates being 50.8 per cent in Louisiana, 49.9 per cent in Rhode Island, 49.4 per cent in Oklahoma, 44.4 per cent in Idaho, 43.2 per cent in Illinois and 41 per cent in Maryland.

State taxpayers, according to the report, were assessed a total of $87,393,500 during 1948, with the cost of individual patient care ranging from an average of $1,085.79 in the District of Columbia to $287.44 in Idaho. In the entire country the annual per capita cost averaged $527.91.

FOREIGN LETTERS

BELGIUM

Fourth Belgian Congress of Surgery.—The Fourth Belgian Congress of Surgery was held in Ghent under the presidency of Professor Tytgat. Van Der Linden and Van Wien presented a well documented report on coagulants and anticoagulants. After discussing the clotting mechanism and reviewing the surgical measures which should be followed in order to assure a successful hemostasis, the authors discussed hemorrhagic syndromes and, especially, the physiopathology of hemophilia. Finally, the general and local hemostatic as well as the anticoagulants heparin, bishydroxycoumarin (dicumarol®), were discussed from the surgical viewpoint, specially in regard to the prophylaxis and the treatment of thrombosis and postoperative embolism. Henrotin, Hoffman and Cornil described the different types of endarteritis and discussed the diagnostic methods. Arteriography of the limbs, aortography and, venography are necessary for the determination of the importance, the location and the type of the lesions as well as the extension of the collateral circulation. The judicious interpretation of these results taken as a whole, permits selection of the best surgical therapeutic method in each case. Reboul and Laubry of Paris reported on their modification of endarterectomy. The results obtained by the authors in the 95 operations performed by them are as follows: there were eight deaths out of 21 operations on the abdominal aorta. Twelve patients who were operated on benefited greatly from their operation for periods varying from 28 to 10 months. Of 74 operations performed on the limbs, there were four deaths, of which two were caused by anesthetic accidents and one was caused by postoperative jaundice. Thirty-four operations were followed by immediate reobliteration. However, of this number, 15 were followed by good results, 9 by fair results and 10 by no change. Thirty-six operations were followed by perfect results, although 85 per cent of the patients had the endarterectomy performed after failure of those therapeutic measures which up to now have been regarded as indicated for either gangrene or impending gangrene.

Critical Situation of the University Hospitals.—The general economic conditions of the country and the increase in the daily cost of living in the university hospitals have caused these hospitals to become progressively more and more deserted by the persons who serve as the foundation for teaching. Recently, a general information meeting was held at the Maison des Médecins, to draw the attention of the public to the problem of the university hospitals. Prof. Bastenié was spokesman for the university hospitals. He explained their triple mission: (1) to establish medical and surgical centers in which large sections of the population can be treated according to the highest scientific standards; (2) to train young doctors, specialists and nurses from the moral as well as from the technical point of view, and (3) to contribute to the progress of the clinical and therapeutic sciences by research. Bastenié points out that there has never been a written law concerning the university hospitals in Belgium. Medical teaching in Belgium is given in the public relief institutions according to agreements between the universities and the Public Relief Commissions. The communities have to provide for the expenses of the hospitals, and this obligation has become excessive. The speaker emphasized that the present problem of the university hospitals goes beyond the limits of the local realm over which the legislation has jurisdiction. It is a national problem with social, scientific and educational aspects. It is, therefore, absolutely necessary that the governmental authorities, supported by the legislative bodies, should find a harmonious solution in coordinating the efforts of the universities, the Public Relief Commissions and the community Administration. Without the assistance of the interested ministerial departments, along with a reform of the present legislation, the future of the university hospitals seems to be very dark.

Mortality in the Congo.—*The Belgian Congo Review* has published a report which illustrates the progress of hygiene in the Congo. This progress is evidenced by the constant decrease in the mortality rate among the European population of the Congo.

Mortality in European Population in the Congo (1920-1949)

Year	European Population	Deaths	Mortality per Thousand
1920	6,971	148	21
1925	15,236	180	11.61
1930	25,179	308	11.23
1935	18,683	149	7.97
1940	29,735	216	7.26
1945	33,787	283	8.38
1949	52,113	302	5.79

Thus, the white population of the Congo has increased 75 per cent since 1940 while the mortality rate has decreased from 7.26 to 5.79 per thousand. The present mortality rate is 3½ times less than that of 1920. However, it is necessary to take into consideration the sending of gravely ill persons back home to Belgium by plane. This progress in hygiene is outstanding in view of the facts that between 1920 and 1949 the proportion of European women and children living in the Congo increased considerably more than the increase of the white population, and women and especially children are more affected by the influences of the tropical climate, and that there are many more Europeans of advanced age at the present time in the Congo than there were in 1940.

Choreic and Parkinsonian Syndromes.—At a meeting of former faculty members of the University of Brussels, Professors Bremer, Kleyntjens and Martin discussed the physiology of the choreic, athetosic and parkinsonian syndromes and their medical and surgical treatment. A common etiologic factor was the special fragility of the corpus striatum (caudate nucleus and putamen forming together the striatum, and the globus pallidus) and the sensitivity of the cells to a variety of noxious agents (anoxia, deficiencies, endogenous and exogenous intoxications, virus, heredodegenerative diseases).

The object of medical and surgical treatment of the striatal diseases is to depress the pathological central activity expressed by involuntary movements and muscular hypertonia. It will vary, of course, according to the condition of the hyperactive central structures.

The old pharmacologic agents, and the newer drugs used in treatment of parkinsonism, probably owe their good effects to the depressive action they exercise on complex central transmissions. Surgical treatment of the choreoathetoid syndromes follows logically from physiopathological data. Treatment of the parkinsonian syndromes still seems to be purely symptomatic. Surgical treatment may eliminate abnormal movements but cause a more or less important paralysis.

The Bufo Reaction.—A joint meeting of the Lille, Dutch and Belgian Societies of Gynecology and Obstetrics was held in Brussels. During the scientific meeting, Pallieb and Cotteel of Lille reported on the value of the bufo reaction as a biologic pregnancy test. The authors believe that the rapidity, the intensity and the persistence of the reaction are three elements which indicate the level of chorionic gonadotropin. They determined the sensitivity of the reaction and defined the toad unit as the smallest quantity of gonadotropic hormones which is necessary and sufficient to cause the appearance of the spermatozoa in the urine.

The items in these letters are contributed by regular correspondents in the various foreign countries.

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DENMARK

State Aid for the Hard-of-Hearing.—The many original articles on deafness in the organ of the Danish Medical Association, *Ugeskrift for Laeger*, for Jan. 4, 1951, focus attention on the interest now taken in this subject by the medical profession, the state and the general public. On Jan. 27 and March 31, 1950, two legislative measures in this field were adopted by the Danish Parliament. This legislation is largely the outcome of the agitation on behalf of the deaf conducted by the Danish Deafness Association. According to the laws of 1950, the state undertakes the education of the hard-of-hearing and of the deaf, and the provision of several state-conducted centers for the welfare of the deaf. The law of March 31, which becomes effective April 1, 1951, enables all who are hard-of-hearing, whatever their occupation and income, to acquire hearing apparatus free of cost if, in the opinion of experts, it is needed. Much has already been done on a voluntary basis by the Danish Deafness Association to provide hearing apparatus on easy terms, but the sums required are so great that state aid was invoked. The new legislation does not now deal with children under the age of 6 years. The cost and upkeep of hearing apparatus are borne by the state.

It has been calculated that every third hearing outfit or apparatus issued to the hard-of-hearing is discarded by the recipient because it has disappointed him for one reason or another. Considering that such an outfit costs about 500 Danish kroner and that there are about 50,000 Danes who are hard-of-hearing, there is great wastage on unused hearing outfits. It could largely be avoided if candidates for this free gift from the state could be carefully selected and given the training and encouragement so often needed if this help is to be effective. Much can also be done by the sympathetic and intelligent cooperation of the medical profession, whose members in many instances have a great deal to learn about the enormous technical strides made during the last few decades in helping the deaf to hear. The recent international course on audiology in Stockholm was a boon in this respect.

The New Death Certificates.—Early in January this year physicians in Denmark received copies of the new forms for the certification of death with printed instructions as to their use. In the old forms, the widespread use of the term "paresis cordis" has perplexed the authorities responsible for the compilation of medical statistics concerned with the causes of death. There has also been a common tendency to fill death certificates with several diseases without any instructive reference as to the causative role of each, and fear of hurting the relatives' feelings has in the past contributed to some sins of omission in death certificates. The new form is drafted in accordance with the international classification of diseases and causes of death as prepared by the World Health Organization and published in the "Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death" (1948). The form is drafted so as to discourage the slipshod use of "paresis cordis" and to encourage doctors to write more clearly. Only those diseases are to be mentioned that may reasonably be supposed to have contributed to the patient's death. It is now possible to include in a death certificate in their proper place such diseases as diabetes and tuberculosis which may have overtaken a patient without actually killing him. There is also a place in the new death certificate for scientific data concerning, for example, the varieties of hypertension. Dr. Esther Ammundsen has warned, on behalf of the public health authorities, that the carelessly drafted death certificate may be returned to its author with a request for greater precision. In such instances an informal call on the phone only a fortnight after the patient's death may right matters more readily than a written document drafted by the public health authorities some three months later. She tempers this warning with the frank admission that in the past she too has drafted death certificates which she now realizes were not as helpful as they should have been.

A New Bartholin Biography.—Bartholin's nationality and the period in which he lived and other data can be found in the second volume of Dr. Axel Garboe's biography of Thomas Bartholin published in 1950 in Copenhagen by Ejnar Munksgaard. Bartholin was perhaps the most distinguished person of his time in the Danish medical profession. Dr. Garboe's second volume deals with Bartholin's career from the time that he retired from teaching, in 1661, till his death, in 1680. He was a man of exceptionally wide interests, and one of his ambitions in early life was to combine philosophy with medicine. He was also a mathematician. Indeed, he was a professor of mathematics the year before he was appointed professor of medicine. Professorships seem to have run in the family, for Thomas himself stepped into his grandfather's shoes, and he had two sons who in their turn became professors, both at the early age of 19. Also, a nephew became a professor at the age of 24. Envious souls have hinted that this concentration of professorships in the family may have reflected nepotism as well as talent in it, and this point among many others of personal interest is dealt with faithfully by Bartholin's biographer. It seems strange that the name of this gifted man may never have been handed down to posterity had he not given a very minute description of two small structures in the human body. Dr. Garboe's biography includes a nine page summary in English for readers who are unfamiliar with the Scandinavian languages.

Child Welfare Committees in Denmark.—At the beginning of this century, when many other countries were trying to solve the problems of juvenile delinquency by creating special law courts, Denmark took another line by creating child welfare committees chosen on democratic principles in each municipality, with powers to deal with a wide range of subjects. The delinquent youth was to be dealt with not in terms of crime and punishment but from an educational point of view. These committees deal with delinquent and neglected children and others whose home environment is objectionable. Since 1930 the criminal responsible age has been 15 years, but juvenile delinquents between the ages of 15 and 18 come under the care of the child welfare committees rather than under that of the representatives of the law.

The social reforms of 1933 provide for the welfare of children defective in many different ways. Notification by school masters and school medical officers is required in every case of defectiveness in childhood, whether it be mental or physical. Children suffering from blindness, deafness, retardation of speech or epilepsy are included in this category, as well as crippled children and those with somatic defects. Each case is dealt with on its own merits with regard to treatment, training and education.

Child psychiatry may be a young discipline in Denmark, but it is certainly undergoing rapid development. At present one of the greatest difficulties is the lack of fully trained child psychiatrists. In spite of this present shortage, Denmark recently exported one of her leading child psychiatrists, Dr. Karen Margrethe Simonsen, who had been invited in 1950 to take charge of a new special child psychiatric department at the Rikshospital in Norway.

Death of Dr. Poul Guildal.—Dr. Guildal, who was born on March 13, 1882, and died on Dec. 26, 1950, was a prominent figure in many ways. Seldom has a man been so richly endowed. Brought up in cultured surroundings, and handsome in a patrician way, he was the lucky child of fortune. But he was no spoiled child, and he was as generous to his fellow beings as Fate had been generous to him. Early in his career he was put in charge of the orthopedic center for cripples, Samfundet og Hjemmet for Vanföre, which came under his guidance to be the best of its kind in Denmark. He was an elegant and sure operator, and an excellent teacher. Enterprising in his adoption of new orthopedic methods, he never forgot the importance of the human element, and he was generously sympathetic toward every cripple coming under his care. His services were called on widely by different bodies, including the Danish Red Cross. At international conferences he was an outstanding figure, because of his linguistic gifts, his mastery of his subject, his distinguished bearing and a certain personal charm which put at their ease all with whom he came in close contact.

MEXICO

Symposium on Steroids.—The first annual conference took place in Cuernavaca (50 miles from Mexico City), Jan. 15-19, 1951. It was organized by a joint committee integrated by Mexican and North American scientists commonly interested in steroids. The Mexican members of the committee made the necessary arrangements for the development of the conference and invited other Mexican specialists; North American members selected other North American guests as well as guests from other countries. All the financial aspects were subsidized by Mexican manufacturers of steroid hormones. Because these substances are obtained from some Mexican roots, 85 per cent of the world steroid output is from Mexico.

There were about 60 attendants at the meeting. Among them were outstanding endocrinologists, such as Abraham White, Randolph Sprague, George Sayers, A. Zaffaroni, Jerome Conn, Konrad Dobriner, Chester Stock, Thomas McGavack and T. S. Danowski from the United States; Hans Selye from Canada; Alejandro Lipschulz, Roberto Llamas and Francisco Gómez Mont, from Latin America; such rheumatologists as Walter Bauer, Paul Holbrook and Javier Robles Gil, and such cancerologists as Roy Hertz and I. T. Nathanson.

Twenty-six papers were read. Generally speaking they were concerned with three broad problems: the antirheumatic activity of steroids; the relations between cancer and steroids, and the metabolic action of steroids, specially of 11-desoxysteroids, with emphasis on pregnenolone. Regarding the third point, the following conclusions were presented at the end of the conference: 1. Pregnenolone and 21-aceto-oxypregnenolone have not been proved, according to the communications presented in the symposium, to possess biological activity which could be determined by usual methods and techniques. It is necessary to note that the biochemical alterations looked for were those observed when cortisone is employed. 2. Pregnenolone and 21-aceto-oxypregnenolone have not been demonstrated to have any antirheumatic properties. 3. Absorption, metabolism and excretion of pregnenolone and 21-aceto-oxypregnenolone in humans and in animals have not been adequately studied.

In an informal communication from Dr. Ciro Azcoitia it was stated that 15 days after the injection of suspensions of pregnenolone microcrystals it is observed that only 50 per cent of this substance is absorbed.

The final judgment of the discussants was that until the pharmacology of pregnenolone and derivatives is more exactly known all its clinical and experimental uses will be subject to erroneous interpretations.

The recommendations for future clinical research in relation with the antirheumatic properties of steroids, are as follows: 1. As long as the mechanism of action of such substances with indisputable antirheumatic activity, like ACTH and cortisone, is not well understood it is desirable to develop future investigations in this direction. Once this problem is solved, the screening of steroids with the same properties will be easier. 2. Before the clinical trials of steroids is initiated, it is necessary to have a clear knowledge of their pharmacology. 3. Because lack of unity of the methods used for clinical application of steroids was evident in the different papers that were presented in the symposium, it was decided to create a committee to determine those conditions in which these substances must be used in the course of rheumatic states. This committee will be presided over by Dr. Walter Bauer, who in due time will suggest its rules of work.

Several papers, clinical and experimental, were read; they dealt with the relations between cancer and steroids: the experimental inhibition of malignant growths by these substances; the usefulness of some hormones in the treatment of human carcinoma, specially of the mammary gland and cervix, and in this regard the utilization of new steroids like dihydrotestosterone and methylandrostendiol, in mammary carcinoma, with hopeful results. In experimental tumors, particularly in some varieties of lymphoma, during the screening of different steroids it was possible to appreciate the inhibitory action of substances like cortisone, compound A and compound S. These studies suggest that in the future it may be possible to obtain new steroids with a more positive anticancer activity and, at the same time, without harmful or undesirable biological effects.

The conclusion of those at the symposium was that steroids have numerous biological actions, only part of which are known, and that of those not yet been precisely determined, some may be of great importance because of their clinical applications. Dr. Abraham White summed up these concepts in the last paper of the conference in which he made some suggestions for future research. He stated:

In recapitulation, therefore, it seems clear that we are on the threshold of what might be termed a steroid era. The organic chemist has produced and will continue to produce an increasing number of new steroids, each of which may be examined in detail physiologically. An intensive effort is indicated to determine whether the great diversity of profound physiological alterations effected by normally produced compound F and corticosterone can not be mimicked at least in part or perhaps wholly by structurally related substances. The history of therapeutic agents is replete with examples of structurally related compounds which have either identical or related pharmacological or physiological effects, and with studies in which the organic chemist has been able both to improve on the potency and activity of naturally occurring substances by the production of synthetically related compounds. In many instances, by alteration of structure, it has been possible to retain certain desirable physiological responses with the concomitant suppression of undesirable side effects.

ECUADOR

Pinta and Yaws in Ecuador.—Dr. Luis A. León, professor of tropical medicine, has studied the frequency and distribution of pinta and yaws in Ecuador. The conclusions that he reached have been used to orient the sanitation campaigns. Ecuador is crossed, from north to south, by two chains of the Andes which divide the country into three regions: the coastal region, by the Pacific; the Sierra, or plateau, region, and the eastern, or Amazon, region. The incidence of yaws is extremely high in the central and northern parts of the coastal region, where there are approximately 15,000 diseased persons. On the other hand, in the plateau region, the incidence of pinta varied from one subtropical valley to another. However, there is an estimated total of 4,000 patients. The incidence of yaws and pinta in the eastern region is about equal, with about 5,000 cases of each. If the sparse population of the eastern region is taken into consideration, the high percentage of infected persons is evident. In the plateau region, yaws is only found up to 1,300 meters above sea level and pinta is found up to 2,600 meters above sea level. The two diseases are peculiar to the rural areas and especially to the rainy zones. Yaws is only found in the forest regions; pinta occurs equally in rainy regions and in dry areas and in areas of scant vegetation. The incidence of yaws is especially high among the Negroes of the northern part of the coastal region (mainly in the Esmeraldas province) and among the Indians of the eastern region. The incidence of pinta among the Negroes, the Indians of the valleys of the plateau region and the Indians of the coastal region is equal. The high incidence of the disease in Negroes and Indians and the low incidence in whites and half-breeds is definitely related to the predominance of Negroes and Indians. The vectors of yaws and pinta are the Hippelates mosquito and the Simulium mosquito, respectively. Both diseases are most often contracted in the second and third periods of childhood. Three periods of evolution can be clearly distinguished in both diseases. The main difference is that, without treatment, the cutaneous lesions associated with pinta are insidious, of slow course and always benign, whereas, in yaws, the cutaneous lesions appear suddenly and are malignant.

The National Health Service in collaboration with the Cooperative Health Service (under the auspices of the United States) has been engaged in carrying out an intensive sanitation campaign in the provinces of Esmeraldas and Manbí, where the incidence of yaws is highest, with the object of eradicating this disease. The campaign includes bettering the hygienic conditions of the people, treating diseased persons and destroying the mosquito vectors.

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CORRESPONDENCE

Sometimes critics of the American Medical Association claim that its publications are not open to those who disagree with the Association's policies. Such assertions are without basis, as anyone who reads carefully THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION *will agree. And yet included in the group that by their actions could be said to be lending aid in the leveling of criticism at the Association are publications which apparently are not anxious to open their own pages to criticism of articles that they carry. Following the appearance of a communication from James Howard Means of Harvard University in the October issue of the* Atlantic Monthly, *Wingate M. Johnson, editor of the* North Carolina Medical Journal, *prepared a reply and requested the editor of the* Atlantic Monthly *to publish it. The editor, we are informed, stated that the December issue would be crowded but that he would be willing to consider a short article. Dr. Johnson prepared the following reply, which was returned with the comment from the editor that he did not think Dr. Means's argument had been met "head on." It is interesting to observe that the only three letters that appeared in* Atlantic Monthly *following Dr. Means' article were highly complimentary despite the fact that a volume of protest against the Means' article was raised all over the country. Dr. Johnson's letter is reproduced below to let the readers of* THE JOURNAL *decide whether it meets "head on" the Means article.*—ED.

MUD NOT THE FOUNTAIN

The Atlantic Monthly for October offers fulfillment of the scriptural prophecy, "And a man's foes shall be they of his own household." Dr. James Howard Means, Harvard's brilliant and capable Professor of Clinical Medicine, is a member of the American medical profession; but Isidore Falk, Oscar Ewing, Claude Pepper, J. Howard McGrath, and other bitter enemies of that organization must have been made happy by his savage attack on it under the title "The Doctors' Lobby." There are officers of the A. M. A. far more capable of defending it than I; but the fact that I have absolutely no official connection with the organization places me in a better strategic position to speak for it than they are. It is true that over the past two decades I have missed few meetings of the A. M. A., and have frequently represented North Carolina's State Medical Society in its House of Delegates. I do not recall ever seeing Dr. Means at a meeting of the A. M. A., and am certain that he has never been a delegate. If he knew it better he might not be so ready to criticize what should be his own household.

That Dr. Means's views are not shared by a majority of the A. M. A. members is evident from the reactions of those who have read his article. A typical response came in a letter from a doctor who has never held an official position with the A. M. A.: ". . . it is ill-conceived and generally bad. It seems teachers and those in high positions and on endowments tend to forget the practice of medicine as a whole."

Dr. Means's tirade against the A. M. A. follows the familiar pattern set by the Washington bureaucrats and such left wing groups as the Physicians' Forum and the Committee for the Nation's Health. He accuses the A. M. A. of being too conservative, of failing to offer the public sufficient protection in the voluntary insurance plans, of allowing its public relations to deteriorate, of being autocratic, of getting into politics, of imposing unnecessary dues upon its members, of objecting to lay control of medical practice, and of opposing government aid to medical schools. Let us consider these accusations as briefly as possible.

The charge that the A. M. A. is too conservative is based chiefly upon its alleged opposition to voluntary insurance plans in the past, and its alleged failure to advocate satisfactory plans now. If Dr. Means had read the publications of the A. M. A. as faithfully as he seems to have read those of its enemies, he would have learned from Bulletin 70 that "the A. M. A. has never opposed the development of voluntary sickness insurance plans in this country as they exist today." The earlier plans proposed were far different from those now offered, and in opposing certain objectionable features, the A. M. A. was safeguarding the patient as well as the physician. One of the greatest, but least appreciated, services the A. M. A. has rendered the public has been in protecting it from various remedies proposed for both bodily and economic ills until those remedies could be analyzed and tested.

Dr. Means overlooks the fact that for years the national, state and county medical organizations have been striving with considerable success to formulate voluntary insurance plans. The number of subscribers to such plans has increased by leaps and bounds: in 1946 there were 40 million enrolled; now there are approximately 70 million. Dr. Means claims that the plans thus far evolved are totally inadequate. Again I would refer him to an A. M. A. publication (Bulletin 71) for evidence, based upon Department of Commerce statistics, that the Blue Cross plan paid 82 per cent of the hospital bill of the average subscriber in the nation, and that Blue Shield paid between 50 and 60 per cent of the cost of the physicians' services. Furthermore, the percentage for the average low income group is above the average, for the upper income group below the average—which is as it should be. And it is quite certain that the larger proportion of the physicians' fees paid by Blue Shield was for major illnesses.

Dr. Means is certainly doing his best to justify the charge against the A. M. A. that "Its public relations are deteriorating. People look upon its motivation with increasing suspicion." If the public confidence in the A. M. A. is not being shaken, it is not the fault of the Washington bureaucrats—witness Oscar Ewing's recent charge before the American Jewish Congress that the A. M. A. is anti-Semitic—nor of such members of its household as Dr. Means and some others of the (so-called) "Loyal Opposition."

To those who know the story behind the brief connection of Raymond Rich Associates with the A. M. A. it is amusing to have Dr. Means quote Senator J. Howard McGrath as saying that the reasons that Raymond Rich Associates resigned as public relations counsel for the A. M. A. "were, in effect, that the A. M. A. does not honestly represent the doctors of America, and . . . refuses to carry out their instructions." As a matter of fact, the resignation of Raymond Rich Associates came about in much the same way as did that of Mr. Louis Johnson, our former Secretary of Defense. Whether or not Dr. Means approves of their successors, they are getting results.

Although Dr. Means speaks of the A. M. A. as if it were a soulless corporation, it is made up of doctors like me and more than 140,000 others, most of whom—fortunately—feel that they can accomplish more as an organization than as individuals. Its House of Delegates is made up of representatives elected by each component State Medical Society, according to the state's medical population. It is the most democratic body I know of, and it alone makes the policies of the A. M. A. If the A. M. A. does not honestly represent the doctors of America, it is the fault of the doctors themselves.

I wonder if Dr. Means knows that in more than three-fourths of the states in the union Grievance Committees have been formed by state medical societies to give all people who have real or imaginary complaints against doctors, individually or collectively, an opportunity to be heard, with the assurance that the hearing will be a sympathetic one, and that, so far as possible, a just solution will be reached. Does this mean that organized medicine is doing nothing to improve its public relations?

The A. M. A. is criticized for imposing dues of $25 per member in order to finance its campaign against socialized

medicine—which smells no sweeter under the name of compulsory health insurance—and the prediction is made that "a goodly number will refuse to pay." In comparison with a Teamsters' Union local dues of $75 and initiation fees of $100, the A. M. A. membership dues are quite reasonable. Provision has been made for exempting those physicians on whom the dues will work a hardship. It is not likely that many members will be lost.

Anyone who for the past two years has read in the *British Medical Journal* the letters from British doctors lamenting their unhappy fate under the socialists' National Health Insurance Scheme will know that $25 a year is a very small price for an American doctor to pay to fight political control of medicine in this country. At the annual meeting of the Canadian Medical Association in June, 1949, I heard Dr. J. G. Hunter, secretary of the British Medical Association in Australia, say that Australian doctors were cheerfully paying an assessment of $75 each to fight government medicine. No doubt they feel well repaid by the results of the recent election in that country.

Although $3.5 million dollars may sound big, it is a trifle compared with the huge sums being spent by the federal government for propaganda purposes. According to House Report No. 786 (80th Congress) in 1946 "total expenditures in the executive branch for publicity and propaganda purposes were $75 million . . . 45,000 Federal employees were engaged, full or part time, in such activities." We know that no small part of this went to finance propaganda for compulsory health insurance. How much better would it have been to spend it in counteracting Communist propaganda!

When he complains that the A. M. A. has entered politics, Dr. Means apparently forgets that its members are citizens as well as doctors, and that they have the right to use their influence both individually and collectively to protect themselves from being regimented as are the doctors in Britain. The A. M. A. has literally had to fight for its life, with the present administration in Washington marshalling all its resources to force a national health insurance scheme upon it. Even if he did not read THE JOURNAL of the A. M. A., Dr. Means must have read in the daily press how in February, 1949, the Board Room of the A. M. A. was broken into and records of the Board as well as brief cases of individual trustees were thoroughly searched. An official statement by the Board of Trustees of the A. M. A. was issued "protesting the use of a police arm of the Government—namely, the Anti-Trust Division of the Department of Justice—in a campaign to discredit American medicine and terrorize physicians into abandoning their opposition to Compulsory Health Insurance." This statement was dated October 6, 1949—and to date it has not been challenged by any Government agency. The same sort of intimidation is being carried on in many states by government agents. Surely the doctors of this country are justified in taking their cause to the people, even if some of the methods used are calculated to appeal more to the emotions than to the intellect.

In their relentless campaign against the A. M. A. the Government agents and agencies have had allies in certain organizations which are decidedly left wing. One of the most active of these groups is the Committee for the Nation's Health (C.N.H.), the chairman of which is Dr. Channing Frothingham, for years Dr. Means's colleague on the Harvard faculty. It was organized in 1946 by Michael Davis, Ph.D., who has for more than 30 years been trying to force some sort of government medicine on the people, and has been maintaining in Washington an active lobby for compulsory health insurance. The C.N.H. is financed chiefly by large contributions from the Rosenwald and Lasker families. In June, 1950, the Democratic National Committee issued a pamphlet entitled "Administration Health Program: A Training Kit for Leaders," which was a demagogic appeal for compulsory health insurance. In August the C.N.H. reissued the same pamphlet under the title "National Health Insurance Handbook: A Practical Guide for Leaders," to be sold at 35 cents a copy (reduced rates in quantities). Since a political party cannot legally sell pamphlets, it is in order to ask, Who paid for printing this pamphlet?

The fact that Dr. Means has never engaged in private practice helps to explain why he deplores "organized medicine's inherent distrust and hatred of any element of lay control in matters pertaining to the provision of medical care," and defends the right of hospitals to "place certain of their doctors on salary and collect from patients for their services." It also explains why in his presidential address to the College of Physicians in 1938 he belittled the "sacrosanct doctor-patient relationship," and said that "Having a third party determine the size of, and even collect the fee from the patient for the doctor . . . increases the likelihood of the patient's receiving from the doctor the best and wisest treatment the doctor is capable of giving."

An article in the September number of *Medical Economics** explains quite well why doctors fight shy of lay control. Instances are given of lay controlled hospital boards forcing doctors to pay the hospital from 20 to 50 per cent of fees collected from their patients; of demanding "initiation" fees of $150 for general practitioners and $500 for specialists; of urging staff members to refer more patients for laboratory and technical services in order to swell the income of the hospital. Knowing that such actions have been taken in my own state, I was not surprised to learn from *Medical Economics* that they are to be found in all parts of the country. One may be pardoned for wondering how much this action on the part of the hospitals increases the likelihood of the patient's receiving from the doctor "the best and wisest treatment possible."

Finally, Dr. Means berates the A. M. A. for opposing federal aid to our medical schools for the education of their students. He should not need a Supreme Court decision to learn that the federal government has the power to regulate that which it subsidizes. It is pertinent here to recall the attitude of medical students who during the war were forced to accept their education at government expense. One wrote (from Harvard): "I don't like having been educated as a doctor at the public expense . . . One wonders what more he contributes to the war by doing at government expense exactly what he would ordinarily do at his own." Another wrote (from North Carolina): "We are selling our souls in monthly installments. It seems to me that up to now the length of time and expense involved have served to safeguard the profession. People who had money enough to finance a medical education were (and are) likely to be people who know and can accept responsibility. People who had determination enough to borrow money to become doctors also are likely to be responsible people. The Government is taking this element out."

Scores of our students at Bowman Gray gave me virtually the same opinion as did these two students. Can it be that these young men were more farsighted than were some of their elders?

Evidently, the animosity that Dr. Means holds against the A. M. A. is of long standing. I recall vividly hearing him when he was president of the American College of Physicians in 1938 take advantage of the occasion to chastise publicly the parent organization—to the great delight of the news-hungry reporters. So much resentment was felt and shown by members of the College that he was constrained to issue an apologetic statement in next day's newspapers; but evidently he has not changed his views. Fortunately, he is in a very small minority, even in the College of Physicians. At the annual business meeting of the College on April 20—in Boston—the following resolution was adopted unanimously:

"The American College of Physicians is dedicated to progress in the art and science of medicine to the end that the best possible medical care may be made available to all the people. It welcomes plans that will advance these aims. It is the conviction of the American College of Physicians, however, that its objectives can be accomplished best in a free society unhampered by governmental control."

In introducing the resolution Dr. Wallace M. Yater of Washington referred to the political battle being waged in Washington to regiment the medical profession, and said that "We have only the American Medical Association to defend us."

After a careful study made for the Senate Brookings Subcommittee on Health, the Brookings Institution stated as one of its conclusions "that the United States under its voluntary system

* Doctors Fight Hospital "Extortion": Edward F. Ryan, Pages 115-118.

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of medical care has made greater progress in the application of medical and sanitary science than any other country." This progress was made under the leadership of the American Medical Association, and all doctors in the country as well as the general public have benefited from the many activities of that organization.

I wish that space permitted me to elaborate on its various councils and on the many ways in which they guard the health and welfare of the American people. A famous surgeon of Boston, Dr. Frank Lahey, when he was President of the A. M. A. in 1941, said that in order to be fully appreciated, the American Medical Association would have to be destroyed. "We are all so adjusted to the aims, the resources and the helpful facilities of the Association that we tend, I believe, to make the mistake that is so often made by unappreciative husbands who think of their good wives much as they think of a comfortable piece of furniture."

Since Dr. Means, in common with thousands of other American physicians, has benefited from the services of the A. M. A., he should remember Shakespeare's admonition: "Mud not the Fountain that gave drink to thee."

WINGATE M. JOHNSON, M.D.
Editor, North Carolina Medical Journal,
Winston-Salem 7, N. C.

OBJECTION TO JOURNAL EDITORIAL

To the Editor:—Your lead editorial in the JAMA of January 27, 1951, was a lengthy diatribe against Mr. DeVoto, Dr. Boas and myself, because each of us independently ventured to dissent publicly from official AMA dogma. You attempted to discredit each of us in turn and implied that we had been guilty at least of some sort of collusion in attacking the tactics employed by the $100,000 a year lobbyists directing the AMA's "National Educational Campaign."

Your three-page dissertation constrains me to ask for less than a column's space in the JAMA so that physicians throughout the country may weigh these facts against your misstatements:

1. I have never met Mr. DeVoto although I am a regular reader of his department in *Harper's* and do not suffer from that confusion as to his identity implicit in your curious use of the word "certain" before his name.
2. I am acquainted with Dr. Boas, but I have not seen him in over a year and we have never discussed either his or my letters to the *New York Times*. Your present antagonists, including Harvard Professor Means, in the October *Atlantic* (upon which you did not comment) are not attacking physicians or their scientific or humane achievements. They are attacking the political leaders of organized medicine for stooping to propaganda techniques unworthy of professional men.

   In the course of several thousand words you found space to charge me with "an untruthful statement" because, in a letter to the *New York Times* on November 23, 1950, I stated that the JAMA was asking me, among its other members, to distribute a 16-page comic strip. You declared: "The rest of his letter does not deserve further comment."

   While you did not send me a personal letter asking me to distribute the comic strip, have you forgotten your editorial in the JAMA, September 2, 1950, page 46?

   To claim that you did not urge your readers to distribute the comic strip is to suggest that national advertisers of a product are not selling anything because they omit the admonition "go to your neighborhood drug store—place 50 cents on the counter, have the clerk wrap it and take it home." In paragraph one of your advertisement you extol the virtues of the product (the comic strip); you indicate where the article can be obtained in the event the reader's dealer (his local medical society) is not yet stocking the product and you advertise a bargain rate for the Giant Economy Size (lots of one million or more). The second paragraph of your sales blurbs adds the so-called prestige factor, familiar to advertising men; the reader may perhaps become a "Physician of Distinction" by emulating Maryland physicians each of whom has been asked to peddle 200 copies of the product. The fact is that you did not simply ask AMA members to distribute the strip; in effect you urged them to do so.

"This booklet," you wrote, tells "medicine's story in a short form that will reach thousands who do not read the more formal treatises prepared on the subject or listen to what promises to be a 'purely educational' radio program—. 'Willie' should take his story all over the country as other societies approve him."

It is not difficult to understand why you so hastily dismissed the rest of my letter to the *New York Times* rather than reply to its points. In this instance, you, the editor of the JAMA, have adopted the propaganda technique now made familiar by Vishinsky; i. e., if you cannot refute an argument, deny the first sentence or the premise and say the rest of the argument is not worth considering. Then go on to another subject, as you did, extolling the scientific achievements of the medical profession, which are not at all disputed.

It is a disturbing commentary on the level to which the present debate has descended that a practicing physician must request space to defend his veracity against unwarranted insults from the editor of the AMA's chief publication, rather than an opportunity to discuss the real issue.

THEODORE M. SANDERS, M. D.,
894 Madison Avenue, New York City.

ACTH AND BURNS

To the Editor:—Whitelaw's provocative case report (*J. A. M. A.* **145**:85 [Jan. 13] 1951) of the favorable effect of pituitary adrenocorticotropic hormone (ACTH) in a severe (90 per cent) body burn brings up a number of problems in the evaluation of pituitary adrenocorticotropic hormone in the management of burns. The first is the estimation of the extent and severity of the burn. One ought always to consider the volume of body tissue burned in the estimation of the extent of thermal injury. The burn is not two dimensional, as measured by body surface, but three dimensional, and thus cannot be accurately measured. Absence of sensation to pinprick may help differentiate third degree (whole thickness of skin) burns from second degree (partial thickness of skin) burns, but the depth of the burn into the adipose tissue or deeper is not thus ascertainable, and the volume of the burn must remain uncertain. Intravascular hemolysis is a sign of an extensive (in terms of volume) burn and hemoglobinuria is demonstrable evidence of severe thermal destruction. A small output of "soy bean" colored urine has grave prognostic significance. Whitelaw's patient excreted 900 cc. of urine in the first 24 hours, a favorable sign. Intravascular hemolysis and/or hemoglobinuria was not noted. Its absence would indicate that the volume of burn destruction in this case was not great. The spontaneous epithelization (though delayed) is further evidence that deep thermal injury was absent in most areas, excepting the areas grafted.

The second problem is that of resurfacing the burn. I am not prepared to question the effect of pituitary adrenocorticotropic hormone on the spontaneous epithelization of the burn wound, but I wish to caution against the postponement of skin grafting in areas that require an elastic skin envelope to function properly.

In a recent case of burn of extensive volume in my experience, pituitary adrenocorticotropic hormone has not been life saving. In other cases in which the full thickness of the skin has been destroyed, pituitary adrenocorticotropic hormone has not altered the usual principles of resurfacing. We have encountered prolific granulation, homografts that did not take and the usual needs for early grafting of such areas as the hand, face, and the flexor joint surfaces.

JOSEPH A. TAMERIN, M.D.,
Division of Plastic Surgery,
Harlem Hospital, New York City.

COUNCIL ON INDUSTRIAL HEALTH

This survey of the teaching of occupational medicine in medical schools is one of a series of similar studies sponsored by the Council on Industrial Health.

C. M. PETERSON, M.D., *Secretary.*

UNDERGRADUATE TEACHING OF OCCUPATIONAL MEDICINE IN AMERICAN AND CANADIAN MEDICAL COLLEGES

Ernest W. Brown, M. D., Chicago

The Council on Industrial Health has taken the position that orientation in occupational medicine should be included in the design of the undergraduate curriculum, in the form of organized instruction under specialized direction. The underlying reasons for this policy call for brief comment.

Each wage earner between the ages of 20 to 65 spends approximately one-third of each working day in active labor and at least two-thirds of his total life span in employment. It is essential, therefore, that the medical undergraduate gain an understanding of the impact of occupation on health and disease so that he will be inclined, and sufficiently well-informed on entering practice to cooperate with industrial medical departments, even though not employed by industry. He should acquire the modern concept of the scope and objectives of occupational medicine and its impingements on general and special medical practice. The medical graduate should be fully aware that his patient has an occupation, that his employment may, and of equal importance may not, bear on the etiology of an injury or illness under consideration, and that therapy is not complete until he can be restored to full or modified earning capacity. Clinical teaching in the past has tended to overlook or failed to emphasize the significance of occupational disease or the influence of occupation in relation to health.

A related factor is the comparatively recent step taken by the Council on Medical Education and Hospitals of the American Medical Association toward official recognition of occupational medicine as a specialty. Criteria for graduate teaching have been adopted and included in the "Essentials of Approved Residencies and Fellowships" prepared by the Council on Medical Education and Hospitals of the American Medical Association. Inclusion of the subject in the undergraduate curriculum stimulates interest and provides the same opportunity for career selection as is afforded in the teaching of the clinical specialties.

OBJECTIVES

This survey undertook (*a*) to collect current data on the time allotted to both didactic and field teaching in occupational medicine in the aprpoved four-year medical colleges of the United States and Canada; (*b*) to conduct an analysis of topical instruction outlines from the various schools with respect to adequacy of teaching in accordance with best current practice; (*c*) to secure information on present practices pertaining to field instruction; (*d*) to determine under what department or departments instruction in occupational medicine is conducted and in what academic year or years scheduled; (*e*) to compare the didactic time devoted to industrial medicine in 1948-1949 with that reported for 1939-1940, that is, after a nine-year interval; (*f*) finally, as the over-all purpose, to promote the general acceptance of occupational medicine as a well-organized discipline in the undergraduate medical curriculum.

PLAN OF CONDUCT

Sixty-nine of the 71 American Medical colleges and 1 of the 9 Canadian institutions were personally visited for the collection of data. With a few exceptions, an advance questionnaire was sent to all deans with a request that it be filled in and returned before the time of the visit. This included the following items:

Do you include a required course in industrial medicine or industrial hygiene listed separately as such?

If so, listed under what department?

If instruction is not organized as a course, under what department is it given?

Total didactic clock hours allotted to the course in industrial medicine or hygiene?

Total clock hours assigned to field trips or other practical demonstrations?

What field instruction is given, including names of industrial plants, city or state industrial hygiene bureaus, or other agencies visited?

Name of person in immediate charge of the course in industrial medicine with faculty title and industrial position, if any.

The topical outline or schedule of course in industrial medicine is requested.

In what year or years is the course given?

Does the course in industrial medicine count as a separate credit for undergraduate?

Do you offer an elective course in industrial medicine?

The dean or his representative was first interviewed and the purpose of the visit fully explained. A conference was then held with the head of the department responsible for teaching the subject and the instructor in immediate charge, wherever organized instruction was conducted. As a result of the interviews, the data in the questionnaires were checked and supplemented by additional notes as indicated, including plans for expansion, if contemplated. In the cases of the ten institutions not personally visited, reliance was placed upon information from the questionnaire and other correspondence.

TABLE 3.—*Medians for Total and Didactic Hours*

Number of Schools	Median Total Hours	Median Didactic Hours
80 American and Canadian schools	9.00	6.75
71 American and Canadian schools excluding 9 with no instruction	10.00	8.00
71 American schools	9.00	6.00
62 American schools excluding 9 with no instruction	10.00	7.50

TABULATION OF THE REPORT

All principal tabulations and the graphic charts numbered consecutively will be found in the appendix of the report. Due corrections where indicated have been made for all institutions so that the data reflect the situation for the academic year 1948-1949.

HOURS OF DIDACTIC AND FIELD INSTRUCTION IN INDUSTRIAL MEDICINE

The basic data for the 80 medical colleges are contained in table 2. For brevity the word "hours" in this report signifies clock hours. "Didactic hours" includes seminar or conference teaching as well as lecture periods. Field instruction embraces visits to industrial medical departments, government industrial hygiene agencies, and workmen's compensation hearings.

FIELD INSTRUCTION

Of the 71 institutions, 31 or 43.4 per cent required field work including 25 American and 6 Canadian schools. The range as recorded in table 2 is 2-21 hours with a median of 6. In certain categories of total teaching time, the percentages of field work time are so high as to lead to the conclusion that many schools are conducting field instruction with little or no didactic preparation of the student. It is not believed that field assignments are profitable under such circumstances. It is evident that there is no standard practice at present concerning the proportion of teaching time which should be required within flexible limits for field visits. This is an important consideration in the design of undergraduate courses.

STUDENT CLERKSHIPS IN OCCUPATIONAL MEDICINE

A few medical colleges have adopted the policy of clerkships in preventive medicine and public health which are analogous to the usual type of clinical clerkship. In several

The tables, with the exception of table 3, and the charts are omitted because of lack of space from THE JOURNAL but will be included in the reprints.

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instances, a specific period of the clerkship is assigned exclusively to occupational medicine such as work in an industrial medical department. The advantages of this method versus the group plan of field visits are obvious and merit exploration by institutions concerned with offering the most effective type of field training.

CRITERIA FOR EVALUATION OF FIELD INSTRUCTION

The number of hours allotted to field instruction are of little or no significance unless conducted in accordance with certain criteria. Thus, a three hour assignment to a single plant properly organized, may be far more effective than several plant visits without adequate planning. The following criteria are recommended:

(*a*) Organized advance preparation by the plant medical department.

(*b*) Limited to small groups of students of 10-12 accompanied by a faculty representative.

(*c*) A preliminary talk to students on items to be observed.

(*d*) Diversity of operations in the plant selected so as to furnish sufficient teaching material.

(*e*) Subsequent report by students on observations made.

While it may not be practicable to apply all of the foregoing criteria rigidly, the first three are indispensable.

YEAR OR YEARS SCHEDULED FOR UNDERGRADUATE INSTRUCTION

Table 5 records 48 or 67.6 per cent of the total of 71 medical colleges as dividing instruction between the third and fourth years of the general curriculum or limiting it to either one. In 12 or 16.9 per cent it is distributed between the pre-clinical second year and one or more of the clinical years; in 11 or 15.5 per cent, teaching of the subject is limited to the second year. It will be noted that at least a part of the instruction is given in the clinical years in 60 schools or 84.5 per cent.

The selection of the clinical years for orientation is sound practice for the reason that the student will have acquired a more mature outlook at this stage of his medical education and his interest therefore, more readily aroused; moreover, he will tend to be more receptive to the clinical aspects of the subject at this time. However, if preventive medicine and public health as a whole is presented in the second year it would be desirable to include a general orientation lecture or two on industrial medicine at this time.

TYPES OF CURRICULA IN UNDERGRADUATE TEACHING

One of the chief objects of this study was to determine the status of teaching in the various schools with respect to adequacy of orientation. Thus far, instruction has been considered from the standpoint of total hours allotted but the limitations of such data are obvious. The question naturally emerges at this point as to what are the minimum criteria for sufficient orientation of the undergraduate. The following are proposed as a composite of best current practice:

(*a*) *Objectives:* An understanding of (1) the mission of medicine and public health in modern industry and (2) the general principles of its administration.

(*b*) *Subject Matter:* General scope and objectives of occupational medicine; the twofold role of the industrial physician as clinician and health officer; organization and administration of an industrial medical service; health maintenance in industry; physical examinations of the worker; health hazards; occupational diseases; workmen's compensation; professional relations; career opportunities and opportunities for training—residencies and fellowships.

(*c*) *Direction:* A specialist in immediate charge.

(*d*) *Duration:* Approximately 12 lecture or seminar hours to be supplemented by 3 hours of field instruction, if adequate facilities are available in accordance with recommended criteria for field work.

(*e*) *Factor of Infiltration:* Supplementary teaching by infiltration from other courses to be promoted.

Types of Instruction: Based on an examination of the curriculum content reported by 66 medical schools, instruction falls roughly into three types:

Type A: An organized program with sufficient time and scope of subject matter for adequate orientation, satisfying or exceeding the foregoing minimum criteria.

Type B: An organized program but with such limitations in time and scope as to fall short of adequate minimum orientation.

Type C: No organized program, teaching consisting of comparatively few lecturers, focusing attention only on scattered aspects of the subject.

Table 6, lists total instruction hours, and the number of institutions reporting instruction classed as A type, B type or C type, respectively. There are obviously some limitations entailed in a classification based on a comparison of teaching programs. Certain schools were readily grouped under A or B type programs, but in some instances a borderline status existed involving a question of opinion. However, despite its shortcomings this classification plan was considered essential for approximate comparative appraisal. Approximately one third of the schools are offering adequate orientation courses while the remaining two thirds either require revision of incompletely organized programs, or the setting up of organized teaching in place of present very limited instruction.

Certain programs of unusual interest merit special mention. Stanford University devotes only two hours to formal lectures, but four seminars of three hours each are conducted. In addition, one well-organized visit to an industrial medical department and another to the State Bureau of Industrial Hygiene are stipulated. Laval University of Quebec, Canada, requires an orientation course of 10 lectures but, in addition, a total of 15 hours is given over to field study, each student is required to submit a health survey report of two industries. The most extensive course is carried on at the University of Wisconsin. The total instruction of 39 hours includes a session for fourth year students of 3½ days in an industrial plant presenting a diversity of operations and potential health hazards. This in-plant program consists of lectures, round table conferences and practical demonstrations of medical department administration and plant procedures. Preliminary orientation teaching is included in the second and third years.

Of 61 American medical schools from which data were received the following appear to offer A type courses; Colorado, Pittsburgh, Michigan, Nebraska, Wisconsin, Louisville, New York, Texas, Indiana, Cincinnati, Marquette, Northwestern, Columbia and Stanford Universities; Jefferson, Hahnemann and Women's Medical Colleges. It is believed that Baylor University is also in this category although the most recent details have not been received. Of the Canadian institutions, those credited with A type instruction are Laval, Montreal, Queens, Toronto and Western Ontario Universities.

CLINICAL INSTRUCTION

Especially organized occupational disease clinics, either inpatient or outpatient, appear to be exceedingly rare in the United States. In fact, comparatively few cases of industrial diseases are found in teaching hospitals for reasons beyond the scope of discussion in this report. However, whenever such cases are available, an effective plan is to call on the faculty member responsible for industrial medical teaching for presentation before students on ward rounds or in the outpatient department. This policy has already been adopted by a few medical colleges. Industrial disease clinics have been recently established at the Massachusetts General Hospital in Boston and at the Massachusetts Institute of Technology. No other clinic of this type was noted during this survey.

ELECTIVE COURSES

So far as could be ascertained, only 2 elective courses in occupational medicine are being offered specifically to undergraduates by medical schools in this country, that is, at Yale University and the University of Utah. Yale University also offers an elective in clinical and industrial toxicology.

INFILTRATION

It is important that formal teaching be supplemented by infiltration from other courses, particularly in preventive medicine and clinical branches. By applying this principal, any phase of internal medicine, public health or other subjects touching on occupational medicine can be brought to the attention of the student. However, this is predicated upon the premise that the faculty in general is interested and alert concerning occupational medicine, which appears to be comparatively rare at present. As far as could be determined in this

survey, very few institutions have taken steps to promote such a plan. The person responsible for the instruction in occupational medicine is in a position, acting as coordinator, to stimulate interest in this direction in the various departments. Goldwater has recently proposed a method of promoting this supplementary form of teaching.

PROGRESS IN UNDERGRADUATE INSTRUCTION

Chart I presents a comparison of data pertaining to required didactic instruction time in 65 medical colleges in 1939-1940 with corresponding data obtained in the present study for the same group for 1948-1949, or nine years later. The conclusion is amply justified that significant progress in the recognition of occupational medicine in the general undergraduate curriculum has developed in the last nine years.

PATTERN FOR AN UNDERGRADUATE COURSE IN OCCUPATIONAL MEDICINE

Criteria for an undergraduate course have been proposed; the recommended minimum time to be 12 hours of systematic instruction with an additional three hours allotted to field work also in accordance with certain criteria. The subject matter for coverage has been outlined. If more time can be assigned, the same topics can be presented in more detail and additional items included. Broad general principles should be emphasized avoiding undue stress on highly technical aspects. The essential objective of the course is to afford the student a modern, intelligent concept of the medical requirements of industry.

BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Hospitals, Charitable: Effect on Status of Hospital of Outstanding Capital Stock.—This was a mandamus action to compel the defendant, state auditor, to honor and pay a requisition of the Mississippi Commission on Hospital Care in favor of the plaintiff, Mercy Hospital-Street Memorial. From a judgment in favor of the hospital, the defendant appealed to the Supreme Court of Mississippi.

The plaintiff was organized in 1903 as a stock corporation for profit under the name of Vicksburg Sanitarium. In 1918 it undertook to obtain exemption of its property from taxation and the Supreme Court of Mississippi held that it was not entitled to such exemption because it was not a non-profit or charitable corporation. In 1933 a competing institution with a similar name, in the same city, viz., Vicksburg Hospital, Inc., amended its charter so as to classify itself for tax exemption purposes as a charitable or non-profit corporation, and upon allowance of such exemption by the circuit court the matter was appealed to the Supreme Court and a decision was rendered on Sept. 23, 1935, holding that it was entitled to such exemption. The question of outstanding capital stock was not involved in the decision. On Oct. 21, 1935, this court overruled a suggestion of error in the case last mentioned and on that very same day the plaintiff herein had its charter amended so as to declare itself a non-profit corporation; however, its stockholders did not surrender their shares of capital stock so as to come within the provisions of our statute, but tenaciously held the same; they did not give up their investment to the cause of charity; they had an original investment of $50,000 in the plaintiff corporation, and they retained their shares of stock evidencing this investment until 1943 when they sold the same to Sisters of Mercy at par. Since the sale of this stock to Sisters of Mercy there has been no change whatever in the plaintiff's corporate structure except that by charter amendment its name has been changed to Mercy Hospital-Street Memorial.

One of the questions raised by this appeal was: In view of the existence of outstanding capital stock in the sum of $50,000 can Mercy Hospital-Street Memorial qualify as a "non-profit hospital"? In connection with this question, said the Supreme Court, a reconciliation between Code 1942, Section 5310, and Section 6, Chapter 363, Laws 1946 as amended was invited. The former section contemplates that charitable associations, churches, religious societies and the like may be incorporated without the issuance of stock. It is prospective; the corporation, to be thereafter organized, "shall issue no shares of stock." The latter citation brings into view the act of Feb. 18, 1948, Laws 1948, Chapter 430, in which Chapter 363 of the Laws of 1946 was amended so as to identify those institutions qualified to receive grants in aid. To the original designation to those only which were publicly owned and operated by the state or a subdivision thereof, recognition of existing corporations was had by including also "those non-profit organizations owned and operated by a corporation or association no part of the net earnings of which inures, or may lawfully inure, to the benefit of any private shareholder, group or individual." It is the view of the defendant that there are only two types of corporations under our law, those which issue stock and are organized for profit and those which are non-profit and issue no stock. Thus the plaintiff is alleged to be of a hybrid status. Defendant, therefore, insists that plaintiff is not a non-profit institution because it has stock outstanding and plaintiff insists that the act of 1948 recognizes the possibility that there may be outstanding stock in a non-profit corporation and urges that in spite the incident of stock certificates the plaintiff is a non-profit institution because it does not, and cannot under the law and its charter, allow any of its profits to inure to the benefit of any shareholder.

We know of no law, said the Supreme Court, which would require a conventional corporation which qualifies for tax exemption or grants in aid to destroy outstanding stock certificates. It is certainly true that this translation from a profit to a non-profit association renders the stock inert save for voting purposes and accords to it only a competency to identify the holders of the legal title to the property. Plaintiff is not, because it is non-profit, of necessity charitable. Its earnings may prove to be substantial. This will be of concern to the state only as a guarantee of the continuance of the public service which it has promoted. But such earnings must be plowed into the corporation. From the point of view of the state it matters not that in the meantime the present and ultimate ownership is in those whose title is evidenced by so-called stock certificates or otherwise. All property is under the ownership of some person or body. The attribute which qualifies the plaintiff for the grant is that, "in all functions which are part of the state hospital plan," it is in fact and by law, by charter, and by its contract with the Commission, a non-profit institution under the supervision of the Commission. Let the certificates be lost, there is still a residual ownership, made effective upon ultimate dissolution. Let the certificates be assigned without the Commission's approval to another person or corporation with or without a capital gain by the present owners, or be restored to a profit status, and therepon the entire hospital property is transfixed by a lien in favor of the State to guarantee the reasonable amount of its grant. Despite insistence to the contrary, no part of the net earnings of plaintiff can, "inure, to the benefit of any private shareholder" at least for the next twenty (20) years. We are not moved, said the court, by the argument that the net earnings, by their very absorption into the institution, and its equipment and its enlargement, are thus safely impounded against the day when there will be, upon dissolution or expiration, a dramatic division of accrued capital gains. The greater the earnings thus turned back into equipment the greater will be the assurance of the Commission that its wisdom, in devolving this responsibility upon the plaintiff, has been vindicated.

Accordingly the Supreme Court held that the existence of outstanding capital stock did not necessarily disqualify the plaintiff as a "non-profit corporation." Other contentions raised on appeal were also resolved in favor of the plaintiff and the judgment of the trial court was therefore affirmed.—*Craig v. Mercy Hospital-Street Memorial, 47 S. (2d) 867 (Mississippi 1950).*

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MEDICAL LITERATURE ABSTRACTS

AMERICAN

A. M. A. Am. Journal Diseases Child., Chicago

81:178 (Jan.) 1951

Circulatory Diseases of Kidneys in Infancy and Childhood: Introduction. W. W. Zuelzer, S. Charles, R. Kurnetz and others.—p. 1.
Id.: I. Symmetrical Cortical Necrosis. W. W. Zuelzer, R. Kurnetz and S. Charles.—p. 2.
Id.: II. Acute Glomerular Thrombosis. W. W. Zuelzer.—p. 15.
Id.: III. Arteriolar Necrosis (Acute Malignant Hypertension). W. W. Zuelzer.—p. 18.
Id.: IV. Occlusion of Renal Artery. W. W. Zuelzer, R. Kurnetz and W. A. Newton Jr.—p. 21.
Id.: V. Ischemic Atrophy of Kidneys. W. W. Zuelzer.—p. 25.
Id.: VI. Thrombosis of Renal Veins. W. W. Zuelzer, R. Kurnetz and R. Fallon.—p. 27.
Id.: VII. Diffuse Hemorrhagic Infarction of Kidneys Without Vascular Thrombosis. W. W. Zuelzer and R. Kurnetz.—p. 38.
Id.: VIII. Lower Nephron Nephrosis. W. W. Zuelzer and R. Kurnetz. —p. 39.
Thallotoxicosis in Preschool Nursery: Report of Four Cases. C. G. Grulee Jr. and E. H. Clark.—p. 47.
Q-T_c Interval of Electrocardiogram in Acute Rheumatic Carditis in Children. N. H. Solomon and M. Zimmerman.—p. 52.
Electrocardiograms with Deep S Waves in All Three Standard Leads: Report of 10 Cases. J. Levinthal, A. Arbor and A. Purdy.—p. 59.
Metabolic Studies in Patients with Intolerance to Complex Carbohydrates. C. U. Lowe and C. D. May.—p. 81.
Physiological Deviations of Premature Infant, with Summary of Principles of Care. H. Reardon, J. L. Wilson and B. Graham.—p. 99.

A. M. A. Archives Neurology and Psychiatry, Chicago

65:1-130 (Jan.) 1951

Poliomyelitis: IV. Study of Midbrain. H. A. Matzke.—p. 1.
*Neurological Complications of Rabies Vaccine: Report of Two Cases. F. R. Latimer, J. E. Webster and E. S. Gurdjian.—p. 16.
Cerebral Circulation in Postencephalic Paralysis Agitans. H. A. Shenkin and J. C. Yaskin.—p. 29.
Motivations in Rehabilitation of Paraplegics. M. P. Manson.—p. 34.
Testing Visual Fields by Flicker Fusion. P. W. Miles.—p. 39.
Lobotomy and Psychopathology. E. R. Reiner and S. L. Sands.—p. 48.
Value of Convulsive Therapy in Juvenile Schizophrenia. S. Levy and R. H. Southcombe.—p. 54.
*Pneumoencephalographic Changes Following Prefrontal Leukotomy (Freeman-Watts Technic). I. Meschan and J. B. Scruggs.—p. 60.
Visual Function in Perimetrically Blind Fields. M. B. Bender and H. P. Krieger.—p. 72.

Neurological Complications with Use of Rabies Vaccine.—Two patients are described in whom neuroparalytic accidents developed in the course of the prophylactic use of rabies vaccine. The first patient was a youth aged 17, the second was a man aged 25. Both patients had had previous antirabies treatment in childhood. In the first of these two cases thoracic transverse myelitis appeared after the tenth inoculation, with subsequent recovery. In the second patient a systemic reaction followed the first injection and encephalomyelitis with intercostal paralysis developed after the eighth inoculation, the process terminating in death. Pathological changes included adventitial infiltration of cerebral vessels with round cells, perivascular microglial reaction and infiltration of the vagus nerve with polymorphonuclear leukocytes. The incidence of neuroparalytic accidents complicating the use of rabies vaccine has been variously reported by American authors as ranging from one in 280 treated patients to one in 8,287 patients. On the other hand, world-wide statistics place the incidence at 1: 5,814 in a series of 1,290,758 treated patients, with a mortality rate of 25 per cent. In 22 cases of neurological reactions to rabies vaccine collected from the literature the males outnumbered the females by more than two to one. The mortality rate in this group was 40 per cent.

Pneumoencephalographic Changes Following Prefrontal Leukotomy.—Pneumoencephalographic studies were made shortly before and up to 20 months after operation in 19 patients who were treated by leukotomy in accordance with the Freeman-Watts technic. In nine of the 19 patients the preoperative pneumonencephalograms were normal in all respects. In five of these nine cases postoperative studies showed diffuse dilatation of the ventricles, and in all nine there was a significant absence of air in the subarachnoid space surrounding the brain. In one case there developed a large porencephalic cyst, occupying almost all of one frontal lobe. In five cases the ventricles appeared normal preoperatively, but there was an increase in the sulcal markings. Postoperatively the ventricles also showed progressive dilatation with obliteration of the subarachnoid space surrounding the brain. In one of these five a porencephalic cyst also developed. In the remaining five cases studied preoperatively there was diffuse or localized ventricular dilatation. In four of these there developed frontal porencephalic cysts, progressive ventricular dilatation and obliteration of the subarachnoid space surrounding the brain. The related pathological changes found in five of seven cases in which autopsy was performed were cystic necrosis of the frontal lobes; atrophy and gliosis throughout the brain; meningeal thickening, scarring and hemorrhage; generalized enlargement of the ventricles, most prominent in the frontal horns, and cystic degeneration of the thalamus and basal ganglia. The hydrocephalus revealed by roentgenography is probably due to a combination of cerebral gliosis and atrophy and a decrease in the absorptive function of the arachnoidal granulations. It may also be related to obstruction to the free egress of spinal fluid between the basal cisterns and the subarachnoid space overlying the brain. Porencephalic cysts occurred with greater frequency in those cases in which dilatation of the anterior horns of the lateral ventricles was present preoperatively, either as a localized dilatation or as a part of generalized enlargement of the ventricular system. The authors feel that this can be explained by the fact that the anterior horns of the dilated ventricles are more easily penetrated by the leukotome at operation. To prevent this, they suggest that pneumoencephalographic studies be included in the preoperative work-up in prefrontal leukotomy. In patients showing dilatation of the frontal horn of the ventricle, the surgical technic should be modified accordingly.

A.M.A. Archives of Ophthalmology, Chicago

45:1-124 (Jan.) 1951

Retinal Detachment and Aphakia. C. L. Schepens.—p. 1.
Retinal Correspondence in Patients with Small Degree Strabismus. A. Jampolsky.—p. 18.
Nitrogen Fractions as Criterion of Preservation of Corneal Tissue. W. Buschke, A. Howard and L. Siegel.—p. 27.
Greater Superficial Petrosal Neurectomy for Relief of Chronic Bullous Keratitis. L. V. Johnson and W. A. Nosik.—p. 32.
Cerebellar-Macular Abiotrophy. W. H. Havener.—p. 40.
Clinical Trial with Chloramphenicol in Ocular Infections. I. H. Leopold. —p. 44.
Investigation of Visual Space: Blumenfeld Alleys. L. H. Hardy, G. Rand and M. C. Rittler.—p. 53.
Amblyopia Independent of Usual Associated Conditions. J. W. Hallett. —p. 64.
Hysterical Amblyopia in Children and Young Adults. E. R. Yasuna. —p. 70.
Peripheral Visual Acuity. F. N. Low.—p. 80.
Lids, Lacrimal Apparatus and Conjunctiva: Review of Recent Literature. J. H. Allen.—p. 100.

The Association library lends periodicals to members of the Association and to individual subscribers in Continental United States and Canada for a period of five days. Three journals may be borrowed at a time. Periodicals are available from 1940 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied with stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted.

American J. Digestive Diseases, Fort Wayne, Ind.

17:387-418 (Dec.) 1950

Dysfunctioning, Non-Calculous Gallbladder. J. F. Crenshaw.—p. 387.
Gastric Residue in Cholecystography. C. Gottlieb and S. L. Beranbaum. —p. 389.
Fat Distribution in Human Liver as Revealed by Fluorescence Microscopy. B. W. Volk.—p. 394.
Diabetes Mellitus and Pernicious Anemia. F. S. Weinberg.—p. 398.
Concurrent Pathology Occurring Within and Without Gastrointestinal Tract Causing Gastrointestinal Symptoms. S. A. Seley.—p. 402.
Unusual Diabetic Coma in Child with Recovery, with Special Reference to Insulin Resistance and Hypopotassemia. A. M. Sindoni Jr.—p. 406.
Gastrointestinal Hemorrhage Due to Ruptured Abdominal Aortic Aneurysm. G. Balakian, C. Ryan and L. L. Perkel.—p. 408.
Acute Hemorrhagic Pancreatitis. W. Saphir.—p. 409.

American Journal of Medical Sciences, Philadelphia

220:597-724 (Dec.) 1950

*Study of Serum Fat Globules in Atherosclerotic and Non-Atherosclerotic Male Subjects. W. J. Zinn and G. C. Griffith.—p. 597.
Oral Treatment of Pernicious Anemia with Vitamin B_{12}. L. M. Meyer, A. Sawitsky, B. S. Cohen and others.—p. 604.
Primary Amyloidosis: Clinical and Pathological Study. W. H. Higgins and W. H. Higgins Jr.—p. 610.
*Nonspecific Granulomatous Inflammation of Stomach and Duodenum: Its Relation to Regional Enteritis. M. W. Comfort, H. M. Weber, A. H. Baggenstoss and W. F. Kiely.—p. 616.
Meningitis Due to Pseudomonas Aeruginosa Treated with Polymyxin B. E. R. Hayes.—p. 633.
Cultural Properties and Pathogenicity of Certain Microorganisms Obtained from Various Proliferative and Neoplastic Diseases. V. Wuerthele-Caspé, E. Alexander-Jackson, J. A. Anderson and others.—p. 638.
Locus of Peripheral Vasodilator Action of Ethyl Alcohol, Tetraethylammonium and Priscoline. L. L. Siems and H. S. Rottenstein. —p. 649.
Occurrence of Renal Insufficiency in Subacute Bacterial Endocarditis. H. Villarreal.—p. 655.
Studies of Immunological Reactions of Patients with Hodgkin's Disease: Tuberculin Reaction. A. Rottino and G. T. Hoffmann. —p. 662.
Inhibition of Hyaluronidase, Using Fluorescein as Indicator. C. R. Shuman.—p. 665.
Experiences with Dilute Prothrombin Time in Diagnosis of Thrombo-Embolic Disease. J. J. Sachs.—p. 674.
Diagnostic Significance of Urinary Pepsinogen Excretion in Diseases of Upper Gastrointestinal Tract. H. D. Janowitz, M. H. Levy and F. Hollander.—p. 679.
Female Urethra. F. B. Block.—p. 683.
Evaluation of Adrenal Cortical Function in Pediatrics: Methods. A. M. Bongiovanni.—p. 697.

Serum Fat Globules in Atherosclerotic and Nonatherosclerotic Subjects.—A dark field microscopic method for visualization of neutral fat globules was used in a qualitative study of lipomicrons (any fat particle) and chylomicrons (large fat particles). Studies were made on blood serums of nonatherosclerotic and atherosclerotic male subjects. Control subjects included both healthy persons and patients with illness unrelated to atherosclerotic disease. The atherosclerotic group was represented by 23 patients with myocardial infarction. In view of the relation between early atherosclerosis and diabetes mellitus, 10 hospitalized diabetic patients were studied in the same manner. Lipomicron and chylomicron levels were first studied in the fasting state. Then the subjects were given a 20 Gm. fat meal and samples of serum were collected hourly for six hours. There was a significantly greater ratio of chylomicrons to lipomicrons in the fasting samples of atherosclerotic patients, but this difference disappeared in the postabsorptive state. Cancer of the rectum, cancer of the sigmoid colon, cancer of the lung, lung abscess, asthma, rheumatoid arthritis, cirrhosis of the liver and traumatic fractures do not influence this variation. Diabetic patients are similar to the atherosclerotic group with regard to lipid particles. The similarity of the absorption of fat by the two groups with respect to actual lipomicrons and chylomicrons determined and the wide discrepancy in the proportion of chylomicrons in the two groups in both fasting and late postabsorptive states suggests that the fundamental difference between these two groups lies in the metabolic control of fat transport and not in the absorption of the fat across the intestinal mucosa.

Nonspecific Granulomatous Inflammation of Stomach and Duodenum.—Nonspecific granulomatous inflammation of the ileum was recognized as a clinical entity and designated as regional ileitis in 1932. Later, when it was realized that the process could involve the jejunum, the entity received the name regional enteritis. Comfort and associates describe five cases of nonspecific granulomatous inflammation in which the stomach and the duodenum were involved. They point out the similarity of the pathological process in the stomach and duodenum to that in the jejunum and ileum. The term nonspecific granulomatous inflammation of the stomach and intestinal tract or nonspecific granulomatous gastroenteritis are regarded as more suitable terms than the older ones, which implied a more limited involvement. Clinically, four features are outstanding when the inflammatory disease involves the stomach and duodenum: (1) continuous and intermittent upper abdominal distress intensified by the ingestion of food, loss of weight and strength, nausea and occasional vomiting; (2) diarrhea, steatorrheal and episodic in type; (3) gastric retention, denoted by a succussion splash and by morning aspiration in the fasting state of larger than normal amounts of gastric contents, and (4) evidence of deficient absorption. Roentgenologically, the picture was that of disturbed motility of one or more portions of the upper part of the gastrointestinal tract. Surgical exploration was done in all five cases and disclosed an inflammatory process, involving the upper part of the gastrointestinal tract and varying in extent and severity. Histological study of the material removed disclosed that the inflammatory process was of the nonspecific granulomatous type seen in regional enteritis. In addition to the symptoms already mentioned, these patients showed macrocytic anemia, hypolipemia, hypoprothrombinemia, hypocalcemia and flattening of the glucose tolerance curve. Roentgenologically, the observations of impaired motility with transitory or permanent constriction distinguish this condition from idiopathic steatorrhea.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

64:907-1078 (Dec.) 1950

Leukemia, Polycythemia and Related Diseases. C.-S. Wright.—p. 907.
Hodgkin's Disease. H. A. Hoster.—p. 913.
Diagnosis and Treatment of Lymphoblastoma and Leukemia from Standpoint of Radiologist. J. L. Morton.—p. 919.
Diagnosis of Early Intestinal Cancer. H. M. Weber.—p. 929.
Submucosal Gastric Lipoma: Report of Case Presenting Interesting Roentgen Sign. G. J. Culver and A. Dobrak.—p. 938.
Intra-abdominal Hernia: Discussion with Report of Case of Incarceration of Jejunum into Transverse Mesocolon. G. H. Alexander and H. H. Richardson.—p. 940.
Visualization of Abdominal Aorta and Its Branches Following Intravenous Injection of Contrast Medium: Report of Four Cases. T. F. Leigh and J. V. Rogers Jr.—p. 945.
*Roentgenological Aspect of Infectious Mononucleosis. J. Arendt.—p. 950.
Intestinal Gas Patterns as Diagnostic Aid. M. O. Cantor and D. W. McLean.—p. 959.
Biological Evaluation of 20,000,000 Volt Roentgen Rays: V. Bar Effect in Drosophilia. W. M. Luce, H. Quastler and E. F. Lanzl.—p. 963.
Use of Precision Cones in Peroral Irradiation. S. G. Castigliano and D. M. Sklaroff.—p. 968.
Experimental Neurography. I. M. Tarlov, D. Berman and J. Epstein. —p. 974.
Isodose Measurements of Linear Radium Sources in Air and Water by Means of Automatic Isodose Recorder. G. J. Hine and M. Friedman. —p. 989.
Clinical Isodose Curves. R. Loevinger, B. S. Wolf and W. Minowitz. —p. 999.
Radium Needle Therapy in Cancer of Cervix Uteri: Description of New Instrument. H. W. Farr and D. J. Roberts.—p. 1010.

Roentgenologic Aspects of Infectious Mononucleosis.—Infectious mononucleosis is commonly regarded as a benign disease occurring sporadically or epidemically with the clinical picture of pharyngitis or tonsillitis usually accompanied with local or general lymphadenopathy. During the last few years the great diversity in the clinical manifestations of infectious mononucleosis has been recognized. These patients may come to the roentgenologist with a tentative diagnosis of pneumonitis, influenza, hepatitis or stomach ailment or of pyelonephritis, leukemia, appendicitis, malaria, brucellosis or typhoid. Such erroneous diagnoses have been made by competent clinicians in atypical cases of infectious mononucleosis, in which adenopathy and sore throat were not present and the course of illness was obscure and protracted. The roentgenologist may even be called on to give roentgen treatment to a patient with lymph node involvement with the diagnosis of leukemia or lymphoblastoma. The detection of atypical lymphocytes and

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the heterophil antibody test are most important in the diagnosis of infectious mononucleosis. However, the reaction to the antibody test may become positive as late as the seventh to sixteenth day and roentgen examination may be requested before this time. The roentgenologist may discover enlargement of the hilar lymph nodes even before peripheral nodes are palpable. Such hilar lymph node involvement accompanied with splenic enlargement permits the roentgenologist to suspect the diagnosis, which, however, can be established only by the characteristic blood picture and the heterophil antibody test. The lung markings are frequently increased and simulate the picture of atypical virus pneumonia. These lung changes are due to perivascular and interstitial foci of atypical lymphocytes and in some cases to true intra-alveolar infiltration with mononuclear cells. Enlargement of the spleen is evident roentgenologically but is more reliably demonstrated by palpation and percussion. The enlargement may persist for months or years after clinical recovery. Hepatitis with or without jaundice is frequent in infectious mononucleosis. Certain obscure cases of moderate hepatomegaly in young persons with or without jaundice who fail to eliminate gallbladder dye may be due to the hepatitis accompanying infectious mononucleosis. An acute abdominal condition may also be simulated by infectious mononucleosis. Mesenteric glands may give direct and indirect signs of enlargement and thus contribute to the diagnosis of infectious mononucleosis.

Arkansas Medical Society Journal, Fort Smith

47:109-129 (Dec.) 1950

A Fancy Package of Untruths. E. L. Henderson.—p. 109.
Infectious Mononucleosis. G. H. Butler, W. J. Butt and F. Richardson. —p. 111.
Unusual Manifestations of Infectious Mononucleosis with Case Report. C. A. Thompson.—p. 114.

Canadian Medical Association Journal, Montreal

63:533-630 (Dec.) 1950

New Anaesthetic Drugs. H. R. Griffith.—p. 533.
Commissurotomy in Mitral Stenosis. E. D. Gagnon.—p. 537.
Cortisone as Adjunct in Treatment of Postoperative Stiffness of Hand. H. Baxter, L. Johnson, V. Mader and C. Schiller.—p. 540.
*Undecylenic Acid Administered Orally in Treatment of Psoriasis. N. M. Wrong.—p. 543.
Choice of Patients for Sympathectomy in Field of Peripheral Vascular Disease. J. A. Evans.—p. 545.
*Scurvy—Recent Experiences. N. B. Coward.—p. 549.
Clinical Use of Oximeter. A. L. Johnson, C. R. Stephen and P. Sekelj. —p. 552.
*Studies of Inheritance of Diabetes Mellitus: I. Relation of Heredity and Age of Onset of Diabetes. M. W. Thompson, L. E. Laakso and E. M. Watson.—p. 556.
Urinary Calculi Associated with Recumbency. D. Swartz and J. R. Taylor.—p. 559.
Acute Nutritional Disturbance in Young Infants Associated with Mastoiditis. C. E. Snelling, D. E. S. Wishart and A. Brown.—p. 563.
Reflex Dystrophy in Upper Extremity. K. MacLean and G. Stranks. —p. 568.
Present Status of Endocrine Therapy in Treatment of Carcinoma of Breast. A. Klass.—p. 571.
Cholecystitis and Cholelithiasis. A. J. Grace.—p. 573.
Diagnosis of Uterine Carcinoma. D. N. Henderson.—p. 581.
Retrolental Fibroplasia. H. Mallek and P. Spohn.—p. 586.
Methadone and Respiratory Tract Fluid. E. M. Boyd and M. Buell. —p. 588.
Adamantinomas. C. Weder.—p. 590.

Undecylenic Acid in Psoriasis.—Ten men and nine women with psoriasis were treated with undecylenic acid by mouth. The duration of the psoriasis varied from six months to 25 years. Duration of treatment varied from one to six months. Dosage recommended was 15 capsules daily, 0.44 Gm. each by mouth, and this dosage was usually maintained for the duration of the treatment. Thus, on the average, each patient was given 90 days' treatment of 6.6 Gm. of the drug daily, or a total of 594 Gm. of undecylenic acid. In 4 patients with intertriginous psoriatic lesions in the crural, inguinal or intergluteal regions itching, redness and scaling were slightly improved. Ten patients showed no improvement, and the condition of five became worse during the treatment. From these results as well as those obtained in four other groups reported on, comprising 18, 40, 30 and 17 patients respectively, the authors conclude that undecylenic acid administered by mouth in large doses affects some cases of psoriasis favorably although slightly but that the improvement is not usually maintained even though administration of the drug is continued.

Scurvy.—Scurvy has not yet disappeared completely in spite of the progress made in the feeding of children. Coward reports the occurrence of scurvy in 37 children. In 33 (89 per cent) of them it appeared within the latter half of the first year of life. The diagnosis in each case was made purely on the basis of clinical and roentgenologic examination. No studies of the blood for ascorbic acid (vitamin C) content were done. The symptoms most frequently observed were pain in the lower extremities, irritability and edema. Bleeding gums were observed only in rare cases. All the patients showed varying degrees of anemia. Factors responsible for the ascorbic acid deficiency were as follows: Some of the children got a sufficient supply of orange juice, but the juice had been warmed or heated, and thus the ascorbic acid had been oxidized. Such oxidation begins as soon as an orange is cut, but the process is accelerated by heat, light and alkalinity. Administration of orange juice to other children was stopped early because of factors such as vomiting or the child's dislike of it. In many cases the parents were told only once to give orange juice to the child, and on subsequent visits to the physician no further check was made to insure that this was being done. Frequently, no orange juice was given. Both parents and physicians are lulled into a false sense of security owing to the long latent period of six to ten months between the beginning of the deficiency in the diet and the onset of symptoms. It is suggested that the physician should, as a routine procedure, always question the parents regarding the intake of ascorbic acid and explain the reasons for the giving of orange juice. If there is any doubt about the cooperation of the parents, or if economic reasons are a factor, the physician should prescribe the easily procurable and well tolerated ascorbic acid tablets.

Inheritance of Diabetes Mellitus.—The relation of heredity and age of onset of diabetes mellitus was studied in 563 male and 817 female patients. The ages of these patients at the onset of diabetes ranged from 14 months to 83 years. A family history of diabetes mellitus was obtained in 50 per cent of the male patients and in 51 per cent of the female patients. The percentage of the patients with diabetic family histories varied inversely with the age of onset of the disease. As compared with the total group, the onset age was latest for the diabetics with no family history, earlier for those with family history and earliest for those with bilateral family history of diabetes mellitus. It is concluded, therefore, that diabetes mellitus behaves genetically as a graded character. This opinion is in disagreement with the view that young diabetics are homozygous and older diabetics heterozygous.

Journal of Nervous and Mental Disease, New York

112:469-560 (Dec.) 1950

Psychology of Gesture. G. Marañon.—p. 469.
Reitman's Pin-Man Test: A Means of Disclosing Impaired Conceptual Thinking. F. Reitman and J. P. S. Robertson.—p. 498.
Anticonvulsive Action of Histamine and of Other Vasodilating Drugs on Experimental Convulsions in Man. F. Kajtor.—p. 511.
*Psychosis with Barbiturate Withdrawal. R. T. Hewitt.—p. 526.

Psychosis with Barbiturate Withdrawal.—During the past six years there has been an increase in the number of patients who use barbiturates in addition to narcotic drugs. Addicts may use barbiturates to tide them over periods when they can obtain no narcotic drugs or they may use barbiturates in addition to what they consider to be an inadequate dosage of narcotic drugs. The withdrawal period in narcotic addicts is complicated by the prolonged use of barbiturate drugs. Convulsive seizures have been observed commonly. The author reviews observations on 12 patients who had used a barbiturate in addition to an opiate. The period of time over which bar-

biturate drugs had been taken varied from 30 days to one year. In all these cases the barbiturate used was secobarbital (seconal®) sodium or pentobarbital (nembutal®) sodium and daily dosage varied from 10 to 30 grains (0.6 to 2 Gm.). Grand mal seizures occurred in most of these cases after withdrawal of the drug. Their occurrence showed no consistent relation to the onset of the psychosis and appeared either prior to the psychosis or during the psychotic period. The psychosis is of a toxic type and is usually ushered in by confusion, disorientation and visual hallucinations of the type occurring in delirium tremens. Illusions and auditory hallucinations of a persecutory nature are common, and the patient is fearful. Death resulted in one patient after a 48 hour period of delirium. The psychoses lasted from five to 14 days. Three case histories are given. Observations suggest that these patients should be given an adequate dosage of narcotic drug during the withdrawal of barbiturates so that the danger attendant on concomitant withdrawal can be avoided.

Journal Pharmacology & Exper. Therap., Baltimore

100:393-520 (Dec.) [Part I] 1950. **Partial Index**

Short Term Chronic Toxicity Test. C. C. Smith.—p. 408.
Studies on Five Long-Acting Choleretics. D. L. Cook, R. G. Bianchi, W. E. Hambourger and D. M. Green.—p. 421.
Effects of Magnesium Ion on Heart and on Its Response to Digoxin. J. B. Stanbury and A. Farah.—p. 445.
Studies on Inter-Relationship of Certain Cholinergic Compounds: V. Significance of Actions of 3-Hydroxy Phenyltrimethylammonium Ion on Neuromuscular Function. W. F. Riker Jr. and W. C. Wescoe.—p. 454.
Preliminary Studies on "Reversed Carboxyl" Analogue of Acetylcholine. W. B. Bass, F. W. Schueler, R. M. Featherstone and E. G. Gross.—p. 465.
Studies on Synthetic Curarizing Agents. C. A. Winter and J. T. Lehman.—p. 489.

100:399-508 (Dec.) [Part II] 1950

Chemotherapy of Amebiasis. H. H. Anderson and E. L. Hansen.—p. 399.
Sites and Mechanisms of Action of Morphine and Related Drugs in Central Nervous System. A. Wikler.—p. 435.

Kansas Medical Society Journal, Topeka

51:553-600 (Dec.) 1950

Coagulability of Blood After Operation. J. L. Morgan.—p. 553.
Medical Aspects of Atomic Explosion. H. R. Landmann.—p. 557.
*Pulmonary Moniliasis. W. W. Abrams.—p. 562.
Typhoid Fever Treated with Chloromycetin: Report of Case. R. L. Jenson and W. E. Spicer.—p. 565.

Pulmonary Moniliasis.—According to Abrams, the monilial group of fungi is present in about 3 per cent of all persons without producing disease. It is often found in normal stools. It may be inhaled in dust or even introduced directly into the blood stream, for instance in drug addicts, who give themselves injections through inadequately disinfected skin. The author reviews the literature on Monilia albicans infection of the lung and describes a case. The pulmonary lesion of moniliasis resembles that of tuberculosis, with consolidation and concomitant production of bands of fibrous tissue. There is usually no cavitation. Microscopically also the lesion resembles that of tuberculosis, with a central area of caseation surrounded by a zone of lymphocytes and occasional giant cells. Certain conditions seem to favor Monilia albicans infection. Asthmatics with bronchiectasis often develop moniliasis, because the bronchiectatic dilatations afford a good soil for the growth of this fungus. The onset of symptoms is usually sudden, with the production of substernal and precordial distress, general weakness, muscle tiredness and profuse sweating. For certainty in diagnosis, the sputum should be thoroughly examined for fungi as well as other organisms. Roentgenologic manifestations of probable tuberculosis lesions with minimal physical observations should be a warning signal for more diagnostic investigation. The treatment of Monilia albicans infection is mainly supportive. Penicillin and the sulfonamides seem to be inert. Methylrosaniline chloride (gentian violet) has been tried, but with little success. Potassium iodide, in doses of 1 to 5 Gm. daily, seems to be the medicament of choice.

Minnesota Medicine, St. Paul

33:1169-1286 (Dec.) 1950

*Hypoplasia of Thoracic Aorta Clinically Simulating Coarctation. A. L. Ferrin, J. F. Briggs and I. D. Baronofsky.—p. 1193.
Treatment of Auricular Fibrillation from Standpoint of General Practitioner. R. H. Conley.—p. 1196.
"Antabuse" (Tetraethylthiuram Disulfide) in Treatment of Alcoholism. J. C. Michael.—p. 1200.
Emergencies in the Newborn Period. L. E. Harris.—p. 1204.
Rana Pipiens Frog Test for Pregnancy. J. E. Hodgson and R. Taguchi.—p. 1208.
*Acute Yellow Atrophy of Liver from SH Virus Transmitted by Blood Bank. W. R. Miller, R. V. Sherman and G. N. Hoffman.—p. 1211.
Practical Considerations in Diagnosis and Treatment of Ectopic Pregnancy. C. H. McKenzie.—p. 1215.
Common Injuries of Knee Joint. E. D. Henderson.—p. 1217.

Hypoplasia of Thoracic Aorta.—Ferrin and associates report on a man aged 25 with hypoplasia of the aorta that clinically simulated true coarctation of the aorta. He had extreme palpitation and some exertional dyspnea and fatigue. There was a dorsal kyphoscoliosis with increased anteroposterior diameter of the chest. A long, harsh systolic murmur was heard best in the left second interspace, and a diastolic murmur was heard over the base of the heart. Chest fluoroscopy showed left ventricular cardiac enlargement and rib notching. The electrocardiogram showed sinus bradycardia and left axis deviation, which was interpreted as probably being within normal limits. An exploratory thoracotomy revealed the left subclavian artery to be dilated to a diameter of 3 cm. The arch of the aorta also measured 3 cm. in diameter, but just distal to the ligamentum arteriosum and the point of most pronounced dorsal kyphosis the aorta narrowed to a diameter of only 1.5 cm. This narrowing persisted down to the diaphragm. Blood flow through this portion of the aorta was apparently adequate. The associated cardiac murmurs and the extent of the hypoplasia of the aorta suggest that this unusual abnormality is congenital. The fact that the narrowing began adjacent to the point of most pronounced dorsal kyphoscoliosis suggests that it is acquired. There is not sufficient evidence to provide a complete answer to this question.

Atrophy of the Liver From Serum Hepatitis.—A case of serum hepatitis transmitted by blood transfusion is reported in a man aged 27 with pulmonary tuberculosis. The patient received four 500 cc. bottles of blood from the blood bank during a lobectomy and three more bottles during a thoracoplasty performed three weeks later. The incubation period, if figured from the first transfusions until the onset of definite symptoms of serum hepatitis, was 79 days. If it is figured from the second group of transfusions it was 57 days. Since the patient received no plasma or serum preparations and the mode of onset and clinical manifestations were typical of serum hepatitis, it was concluded that the serum hepatitis virus came from one of the blood donors. For the first three weeks of illness a cholangiolitic type of reaction was dominant, with complete intrahepatic biliary obstruction and only moderate hepatic cellular involvement. This was indicated by the clinical course, the return of prothrombin function to normal and results of the liver biopsy, which showed an intense periacinar reaction. From then on the course was that of hepatocellular degeneration with extensive necrosis, atrophy, hepatic fetor and a typical hepatic death.

New England Journal of Medicine, Boston

243:939-978 (Dec. 14) 1950

*Myasthenia Gravis Associated with Adrenocortical Insufficiency: Report of Case with Post-Mortem Findings and Review of Literature. C. A. Kane and L. Weed.—p. 939.
March Hemoglobinuria in a Woman. D. R. Gilligan and M. D. Altschule.—p. 944.
Psychiatry in General Practice—Some Aspects of Fear. G. B. Beaman.—p. 949.
*Successful Post-Mortem Cesarean Section Following Death from Pulmonary Tuberculosis. M. Kronick.—p. 953.
Syphilis (Concluded). G. M. Crawford.—p. 955.

Myasthenia Gravis Associated with Adrenocortical Insufficiency.—Kane and Weed report on a fatal case of myasthenia gravis with associated severe adrenocortical insufficiency in an adolescent male aged 18. Necropsy revealed an enlarged thymus gland, one focus of lymphocytic infiltration in the psoas muscle,

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extensive atrophy of the cortices of both adrenal glands and unusual, probably nonspecific changes in the pituitary gland. The development of ptosis of the eyelids, slurred speech and dysphagia one month before the onset of symptoms clearly attributable to adrenal insufficiency may be interpreted as indicating that the myasthenic syndrome was primary in this patient. The initial onset with weakness makes it difficult to decide this point, and the authors believe that the two pathological processes were essentially simultaneous in onset. This situation, believed to be unique in the available medical literature, is considered to be simply an uncommon coincidence of two pathological states, each relatively rare.

Postmortem Cesarean Section.—Kronick performed an immediate postmortem cesarean section on a Negress, aged 18, who had died from pulmonary tuberculosis. The fetal heartbeat, which had previously been distinctly heard, had became inaudible, but a distinct kick by the fetus was felt through the abdomen. The baby was delivered within five minutes after the mother's death and was resuscitated without unusual difficulty. It was a male weighing 4 pounds (1.8 Kg.) and appeared to be about two months premature. Reactions to tuberculin patch tests performed at 2 and 10 weeks of age were negative. The infant now is 2½ months old and seems to be normal in all respects. No previous cases of postmortem cesarean section done on patients who had died from pulmonary tuberculosis have been recorded. With an estimated 90,000 patients with active tuberculosis confined to sanatoriums and rest homes the incidence of pregnancy among the women patients might be significant, and the possibility of a cesarean section at the time of death should be realized. There is no reason to suspect that the rescued infant may not prove healthy and normal in all respects whether the death of the mother was caused by pulmonary tuberculosis or other disease.

Southern Medical Journal, Birmingham, Ala.

43:1007-1104 (Dec.) 1950

New and Simplified Technic of Ankle Fusion. J. W. White and W. A. Hoyt Jr.—p. 1007.
Diagnostic Aspects in 300 Knee Injury Cases. H. W. Virgin Jr.—p. 1017.
Metallic Fixation of Tuberculous Joints: Preliminary Report. M. C. Cobey.—p. 1023.
Prolonged Spinal Cord Compression of Traumatic Origin: Report of Two Cases with Improvement Following Surgical Intervention. L. M. Helfer.—p. 1027.
Distribution of Radioactive Gold Colloid in Rats, Mice, and Transplanted Mouse Tumors. G. Z. Williams, A. C. Stanton, R. M. Jamison and J. T. Williams.—p. 1031.
Bronchopulmonary Hypogenesis: Diagnosis in the Living. I. Meschan and J. D. Calhoun.—p. 1038.
Diverticulum of Thoracic Esophagus. W. R. Deaton Jr. and H. H. Bradshaw.—p. 1042.
Lupus Erythematosus: Case Report Demonstrating L. E. Cell Phenomena. S. Alterman and W. Lindau.—p. 1046.
*Pharmacologic Reactions of Normal and Psychotic Blood Sera. D. I. Macht.—p. 1049.
Terminal Bowel Intussusception Pain Syndrome and Sigmoido-Rectal Procidentia. R. L. Murdoch.—p. 1057.
Effect of Age upon Obstetric Complications in the Primigravida. E. F. Dodge and W. E. Brown.—p. 1060.
Obstetrical Blood Loss. J. C. Baker and T. Harrison.—p. 1067.
Accomplishments in Rural Area with Obstetric-Gynecologic Resident Extension Program. J. H. Ferguson.—p. 1069.
Urecholine and Furmethide Stimulation of Hypotonic Bladder. A. W. Boone. —p. 1073.
*Response of Patients with Pernicious Anemia, with Nutritional Macrocytic Anemia and with Tropical Sprue to Folinic Acid or Citrovorum Factor. T. D. Spies, G. Garcia Lopez, F. Milanes and others.—p. 1076.
Contusion of Heart. J. M. Miller, M. Ginsberg and R. J. Lipin.—p. 1082.

Reactions of Blood Serum from Psychotic Patients.—By means of phytopharmacologic studies Macht claims to have discovered in the blood of patients with various diseases various toxins that cannot be demonstrated by ordinary biochemical and physical tests. In his technic, the effects of drugs, poisons or serums on the root growth of Lupinus albus seedlings are measured under standardized conditions of light, temperature, humidity and other ecologic factors. This report is concerned with phytopharmacologic studies on the blood serum of about 1,200 patients with various forms of mental disturbance. It was found that the blood serum of patients with true psychoses produces a phytotoxic influence on the root growth of Lupinus albus seedlings. Phytotoxic effects are present both in organic and functional psychoses, the degree of toxicity varying with the severity of the disease. Such phytotoxic reactions are also exhibited by spinal fluid from psychotic patients. The phytotoxic properties of serum from psychotic patients are rapidly destroyed by irradiation of such serum with small doses of filtered roentgen rays, and this procedure is useful in verification of the diagnosis. The same tests offer a criterion for evaluation of the results of various therapeutic procedures. The forensic possibilities of such tests deserve further investigation.

Folinic Acid, or Citrovorum Factor, in Anemias and Sprue.—Substances that are structurally and functionally closely related to folic acid have been found to be 100 times as active as folic acid in overcoming the effects of a so-called folic acid inhibitor. These compounds appear to be folic acid coenzymes, or compounds certainly more complex than folic acid itself. The University of Texas investigators term these substances the folinic acid group. Others call them the citrovorum factors. When this new growth substance was identified and obtained in crystalline form, the authors studied its effect on the megaloblasts of persons with certain types of anemia in relapse. Four patients with pernicious anemia, four with tropical sprue and two with nutritional macrocytic anemia were selected for study. Two of the patients, each of whom was given 200 units a day of the growth factor for 10 days, had submaximal clinical and hemopoietic responses. Four patients did not respond. The remaining four patients, who received the growth factor in much larger doses, had maximum clinical and hemopoietic response. These observations show that folinic acid, or citrovorum factor as it often is called, when administered in adequate amounts, is an effective antianemic substance in promotion of blood regeneration in persons with pernicious anemia, nutritional macrocytic anemia and tropical sprue in relapse. The clinical response parallels the hemopoietic response.

U. S. Armed Forces Med. J., Washington, D. C.

1:1379-1592 (Dec.) 1950. **Partial Index**

Psychiatric Treatment in Combat Areas. S. W. Ranson.—p. 1379.
Insulin Resistance: Mechanisms Involved and Influence of Infection and Refrigeration. J. W. Sherrill and R. Lawrence Jr.—p. 1399.
Carcinoma of Prostate. J. C. Kimbrough.—p. 1411.
Empyema in Infancy. J. A. Doucett and J. T. Bowers.—p. 1419.
Repair of Mandibular Bone Defect with Bone Chips. D. W. Wickstrom and R. F. Huebsch.—p. 1425.
Use of Anterior Iliac Crest as Source of Bone Graft. T. H. Crouch. —p. 1431.
Demerol, Scopolamine, and Caudal Analgesia: Results in 700 Cases. W. W. Manson.—p. 1437.
Antibiotics in Gastrointestinal Surgery. J. R. Shaeffer and E. J. Pulaski.—p. 1447.
Superior Vena Caval Syndrome: Report of Two Cases. G. M. Kahn. —p. 1455.
Breast Feeding. H. J. Morrison.—p. 1473.
Transposition of Great Cardiac Vessels. W. W. Cox, P. M. Morgans and R. H. Holmes.—p. 1483.
Apocrine Hamartomas. J. L. Grund and C. A. McNicol.—p. 1489.
Comparison of Ephedrine and Desoxyephedrine in Maintaining Blood Pressure During Spinal Analgesia. C. A. Baldwin Jr.—p. 1495.
*Herpes Zoster Concurrent with Varicelliform Eruption: Report of Five Cases. A. T. Henderson and D. C. Young.—p. 1499.
Mobilization of Medical Supply and Equipment Industry. E. T. Kretschmer.—p. 1517.

Herpes Zoster Concurrent with Varicelliform Eruption.—An etiological relation between varicella and herpes zoster has been suggested, but experimental verification is lacking. Conclusions can be drawn only from clinical observations. The authors describe five cases observed during the past two years in which herpes zoster concurred with varicelliform eruption. After citing some earlier studies on complement fixation, agglutination and inoculation experiments that were carried out to throw light on the relationship between herpes zoster and varicella, they conclude that the evidence strongly suggests that the two diseases are caused by similar viruses, if not a single agent. The cases here reported were characterized first by the appearance of skin lesions typical of herpes zoster, followed after a period of one to six days by the appearance of a monolocular, vesicular eruption on an erythematous base, occurring in crops. This eruption was indistinguishable from that of chickenpox. A history of previous attacks of chickenpox or herpes zoster was obtained in none of these patients. The varicelliform eruption resolved in the manner usual for chickenpox and independently of the resolution of the herpes zoster.

FOREIGN

Archives of Disease in Childhood, London

25:313-422 (Dec.) 1950. Partial Index

Erythrogenesis Imperfecta. I. A. B. Cathie.—p. 313.
Intracranial Irritation in the Newborn: Immediate and Long Term Prognosis. W. S. Craig.—p. 325.
*Effects of Neonatal Asphyxia on Physical and Mental Development. W. A. B. Campbell, E. A. Cheeseman and A. W. Kilpatrick.—p. 351.
Survey of 400 Cases of Cerebral Palsy in Childhood. P. Asher and F. E. Schonell.—p. 360.
*Relation of Birth Weight to Physical Growth: Statistical Study. R. S. Illingworth, C. C. Harvey and G. H. Jowett.—p. 380.
Reiter's Syndrome in Childhood. B. D. Corner.—p. 398.
Studies of Cerebrospinal Fluid Circulation in Tuberculous Meningitis in Children: Part I. Use of Penicillin as Tracer Substance. J. Lorber. —p. 404.

Effects of Neonatal Asphyxia on Development.—Campbell and associates attempted to examine the present physical and mental condition of 89 children with severe asphyxia neonatorum born during the years 1938 to 1941 in the Royal Maternity Hospital, Belfast. These were compared with a group of 178 unselected control children. Of the total 267 children, 195 (73 per cent) were ultimately examined. A comparison of information in the birth records between the examined and the unexamined groups of children did not reveal significant differences. It seems unlikely, therefore, that the loss of 27 per cent of the original subjects would interfere with the assessment of the ultimate prognosis of asphyxia neonatorum. After due allowance for relevant concomitant factors, no significant difference has been found in the average physical measurements (height, weight, chest measurement on inspiration and expansion), in hemoglobin levels or in intelligence distributions between the asphyxia group and the control group. Contrary to the impression given in most other work, the present data and analysis give no support for the hypothesis that asphyxia neonatorum is a common cause of later mental or physical retardation.

Relation of Birth Weight and Growth.—Illingworth and associates had demonstrated earlier that the birth weight of a child bears an important relation to his subsequent weight and height. In the studies reported here, they tried to determine whether children with different birth weights differ in all the standard body dimensions. They measured the weight, standing and sitting height, pelvic girth, chest and calf circumference in 238 children, aged 5 to 8 years, of three birth weight groups: 5 lb. 8 oz. (2,494.76 Gm.) or less, 7 lb. 2 oz. (3,231.84 Gm.) to 7 lb. 6 oz. (3,345.24 Gm.), and 8 lb. 8 oz. (3,855.53 Gm.) or more, and analyzed them by statistical methods. It was found that in all measurements the children of the lowest birth weight groups were smaller than those of the largest birth weight group, the measurements of the children of average birth weight falling in all cases (except in sitting height) between the two.

British Journal of Industrial Medicine, London

7:161-222 (Oct.) 1950

Education and Function of Industrial Health Team. R. E. Lane.—p. 161.
Environmental Conditions in Mercury Mine of Idria. V. B. Vouk, M. Fugaš and Z. Topolnik.—p. 168.
*Lead Encephalopathy in Cooperage. W. Hay.—p. 177.
Size and Nature of Dust Particles Found in Lung Tissue. T. Bedford and C. G. Warner.—p. 187.

Lead Encephalopathy.—Of four coopers exposed to apparently similar risks, two developed lead poisoning and two remained in good health. Individual sensitivity may explain this fact. Alcoholics are particularly susceptible to lead poisoning. The man with encephalopathy was an alcoholic, but an even heavier drinker than he was perfectly well after 10 years' exposure, and the other cooper who showed evidence of poisoning was a teetotaller. The men were repairing barrels that had contained white lead. Their instructions to don masks, damp the barrel, empty out any white lead and replace the lid were largely disregarded, and clouds of dust rose up. Some barrels had contained white lead in linseed oil; this had set hard, and to soften it a wood fire was lighted in the barrel, which after a few minutes could be scraped clean. Perhaps the most serious hazard was a small brazier, on which tea water was heated; parts of a barrel thickly covered with white lead served as fuel. This was probably responsible for the high lead content of the surrounding air. The possibility of lead poisoning in the reported case was at first overlooked, through failure to obtain a good history. Differences between this form of encephalopathy and that due to tetraethyl lead are outlined. Cases of inorganic lead encephalopathy in adults are rare, and evaluation of various therapeutic methods is therefore difficult. Repeated withdrawal of cerebrospinal fluid by lumbar puncture seemed to be the only valuable therapeutic measure.

Journal of Hygiene, London

48:257-396 (Sept.) 1950. Partial Index

Theory of Amoebic Surveys. H. O. Lancaster.—p. 257.
Multiplication of Influenza Viruses in Fertile Egg: Report to the Medical Research Council. L. Hoyle.—p. 277.
Accidents Among Children Under Two Years of Age in Great Britain. G. Rowntree.—p. 323.
Vaginal Corynebacteria. N. Laughton.—p. 346.
Anti-Globulin Technique Applied to Detection of Non-Agglutinating Antibody Against Salmonella Typhi O in Human Sera. F. S. Stewart and J. D. McKeever.—p. 357.
Comparative Study of Tuberculosis Mortality Rates. V. H. Springett. —p. 361.

Lancet, London

2:887-940 (Dec. 30) 1950

*Surgical Relief of Congenital Cyanotic Heart-Disease: Late Results in 72 Cases. T. H. Sellors and J. R. Belcher.—p. 887.
Pulmonary Hypertension in Mitral Stenosis. R. I. S. Bayliss, M. J. Etheridge and A. L. Hyman.—p. 889.
17-Ketosteroid Excretion in Diagnosis of Endocrine Dysfunction. W. R. Butt, A. S. Mason and C. J. O. R. Morris.—p. 894.
Milkman's Syndrome in Idiopathic Steatorrhoea Complicated by Refractory Macrocytic Anaemia. A. Anderson.—p. 897.
*Primary Streptomycin-Resistant Tuberculosis in a Newborn Child: Simple Method of Assessing Streptomycin Resistance. J. E. Tinne and J. L. Henderson.—p. 901.
Thrombotic "Hydrocephalus" in Insulin Therapy. J. Donnelly and E. J. Radley-Smith.—p. 904.
Pulmonary Fibrosis Following Granulopenia. J. Friend and A. C. Thackray.—p. 909.
Prevention of Haemolysis During Freezing and Thawing of Red Blood-Cells. A. U. Smith.—p. 910.

Surgical Relief of Congenital Cyanotic Heart Disease.—Ninety-three patients were subjected to surgical treatment for congenital cyanotic heart disease. Of the first 25 patients, six died during or shortly after the operation, whereas, among the later 68 cases, there were only three surgical fatalities. Seventy-two of the patients were followed up six months or more. Of these, 65 had typical tetralogy of Fallot; two had situs inversus and Fallot's tetralogy; two had transposition of large vessels; one had tricuspid atresia and two had pulmonary stenosis. Associated anomalies included bilateral venae cavae, right-sided aortic arch, absence of the lowest segment of the sternum and absence of the right pulmonary artery. The authors discuss the incidence of the various signs and symptoms, such as cyanosis, dyspnea on exertion, clubbing of fingers and polycythemia, and review radiological and electrocardiographic examinations on all patients. The diagnosis was usually based on clinical data, and so they feel that cardioangiography and catheterization of the heart should be used only in cases in which diagnosis is difficult or doubtful. These procedures are highly valuable, but diagnosis can usually be made by simpler clinical and radiological methods. The operation usually employed was a left end to side Blalock type of anastomosis between the pulmonary and subclavian arteries using a posterolateral approach. The pericardium was routinely opened, and the heart and site of the stenosis examined. The end result, as judged through periods ranging from six months to two and a half years, was gratifying. One patient died suddenly a year after operation, and seven were not improved; but great benefit was obtained by 42 patients, who were previously severely disabled, and an additional 22 gained significant benefit in exercise tolerance and general health.

An asterisk (*) before a title indicates that the article is abstracted. Single case reports and trials of new drugs are usually omitted.

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Primary Streptomycin-Resistant Tuberculosis in a Newborn Child.—Tinne and Henderson describe an infant who was hospitalized at 11 weeks and died at 25 weeks from miliary tuberculosis. In this infant, tubercle bacilli that were highly resistant to streptomycin were isolated before the start of the streptomycin therapy. The mother, who was the probable source of infection, likewise had not previously received any streptomycin. The authors describe a simple vertical diffusion streptomycin sensitivity test that has advantages over the standard Dubos test and also indicates the number of resistant variants present. In this test, 6 milliliter amounts of Löwenstein-Jensen medium are poured into 30 cc. screw-capped vials and solidified as slants. Any condensation water is decanted, and 1 milliliter of streptomycin solution is added to the bottles at the base of the slant in three strengths: 1, 10 and 100 micrograms per milliliter. Such concentrations cover the range attainable by clinical dosage. The vials are refrigerated until required. For each test the sputum specimen is concentrated and standard loopfuls are inoculated by streaking the entire slant of plain Löwenstein-Jensen medium, and the streptomycin-containing media. Similar cultures of the strain H37 RV are made as controls. The bottles are incubated in the upright position. After three or four weeks' incubation at 37 C., confluent growths are seen on the control slants, whereas the bottles containing streptomycin show zones of complete inhibition extending from the bottom of the bottle and varying in extent with the dose of streptomycin and the sensitivity of the organism. The authors emphasize the prognostic value of a streptomycin sensitivity test on organisms isolated before the start of streptomycin therapy and make a plea for the routine performance of a simple initial test such as the vertical diffusion test described here. They feel that the streptomycin-resistant strains in the vast majority of cases can be traced to infection from patients who have received streptomycin therapy and in whom the surviving tubercle bacilli have developed streptomycin resistance. Thus, the proportion of streptomycin-resistant tubercle bacilli in a community is likely to increase in proportion to the greater use of streptomycin. This development of resistant strains is a feature of antibiotic therapy in general, the increasing prevalence of penicillin-resistant Staphylococcus aureus being an example.

Medical Journal of Australia, Sydney

2:777-812 (Nov. 25) 1950

Occupational Factors in Pulmonary Dust Disease. G. C. Smith.—p. 777.
Changing Face of Obstetric Infection. A. M. Hill.—p. 782.
Torsion of Testis and Its Appendages. S. H. Lovell.—p. 787.
*Hepatitis: Treatment with Brewer's Yeast. N. Davis.—p. 790.
Immunization Against Tuberculosis in Australia and New Guinea. E. A. North and D. Jamieson.—p. 792.

2:813-844 (Dec. 2) 1950

Significance of Incubation Period in Infectious Diseases. F. Fenner.—p. 813.
Venous Occlusion Plethysmography: Critical Study. A. J. Barnett.—p. 818.
Extended Radical Vulvectomy of Stanley Way. M. Stening.—p. 823.
Recurrent Abdominal Pain in Childhood. E. S. Stuckey.—p. 827.

2:845-880 (Dec. 9) 1950

Conditions of Civilized Living and Problems of Mental Health. O. A. Oeser.—p. 845.
Intractable Pain as Surgical Problem: Some Conclusions on Relief of Pain by Operations upon Central Nervous System. J. L. Dowling.—p. 850.
Congenital Deaf-Mutism Pigmentary Degeneration of Retina, and Amentia. B. H. Peterson.—p. 854.
Perspective in Pathology. R. Webster.—p. 858.

Hepatitis: Treatment with Brewer's Yeast.—Davis evaluates the results of therapy in 126 patients with early acute or subacute hepatitis. Late cases of advanced cirrhosis of the liver were not included in this series. When a patient came under observation, liver function tests (galactose tolerance, serum cholesterol estimation and hippuric acid excretion) were carried out, and these were repeated at intervals of three to six months throughout the treatment. In the 19 severe cases the patients were put to bed for a period of four to six weeks. All other patients were allowed to carry on their duties without interference. All were given a diet of high caloric content consisting of 140 Gm. of protein, 350 to 400 Gm. of carbohydrate and 70 Gm. of fat. To this diet was added vitamin B complex consisting of a daily dosage of 30 mg. of B_1, 5 mg. of riboflavin and 25 mg. of niacin. Neither choline nor methionine was included in the diet. All patients were given 12 Gm. of dehydrated brewer's yeast daily. This was given during each meal, dissolved in barley water, milk or fruit juice. With this treatment, 29 patients were cured, 40 were improved, 52 were relieved, four obtained no relief and one died. The author feels that dehydrated brewer's yeast containing a high percentage of vitamin B has definite therapeutic value.

Proceedings of Royal Society of Medicine, London

43:775-936 (Nov.) 1950. Partial Index

History of Diverticulitis of Intestine. S. W. Patterson.—p. 785.
Fifty Years of Physiology. K. J. Franklin.—p. 789.
Some Aspects of Atomic Medicine. J. M. Holford.—p. 851.
Treatment of Malignant Tumours of Nasopharynx. S. Kramer.—p. 867.
Hormone Therapy in Relation to Radiotherapy in Treatment of Advanced Carcinima of Breast. V. A. Stoll.—p. 875.
Differential Spinal Block with Particular Reference to Hypertensive Patients. J. G. Arrowood.—p. 919.

Acta Chirurgica Scandinavica, Stockholm

100:391-530 (Dec. 5) 1950. Partial Index

*Clinical Experiences of 21 Cases of Hyperparathyroidism with Special Reference to Prognosis Following Parathyroidectomy. J. Hellström.—p. 391.
Value of Total Gastrectomy in Certain Cases of Peptic Ulcer. O. Schuberth.—p. 434.
Cholecystitis and Situs Inversus Abdominalis: Report of Case. S. Kullander.—p. 444.
*Rapid Growth of Thymus with Compression Symptoms in Infant. P. Sandblom—p. 466.
Papillary Carcinoma of Bladder Treated by Combined Chemo- and Electro-Coagulation. S. Richter.—p. 471.
PAS and Streptomycin in Preoperative Treatment of Far Advanced Pulmonary Tuberculosis. B. Carstensen and A. Odelberg.—p. 476.
Combined Streptomycin-PAS (Para-Amino Salicylic Acid) Treatment of Tuberculosis of Urinary Tract. N. Gyllensvärd.—p. 488.
Sympathectomy for Severe Painful Leg Ulcers. S. Lindgren.—p. 498.
*Küntscher's Medullary Nailing. S. Lindvall.—p. 522.

Prognosis and Treatment of Hyperparathyroidism.—Hellström reports 21 cases of hyperparathyroidism followed six months to 20 years. Renal changes were present in eight cases, osteitis fibrosa cystica in seven, and a combination of these changes in six. Treatment consisted of parathyroidectomy alone in 15 patients, parathyroidectomy preceded by intensive roentgen therapy in three patients and roentgen therapy alone in one patient. Two had no specific treatment. The extirpated parathyroid glands showed diffuse hyperplasia in five cases and adenoma in 13. From this series the following conclusions were drawn: (1) The prognosis following parathyroidectomy depends chiefly on the degree of renal damage at the time of operation. Some improvement is possible after operation, but usually this damage persists or shows progression. Renal damage is an early symptom of hyperparathyroidism and is mainly due to calcium deposition in the tubular epithelium and to vascular changes leading to nephrosclerosis. Clinically this is manifested by impaired concentrating ability of the kidney resulting in polyuria and hyposthenuria. (2) Evaluation of prognosis requires a long follow-up period, since the patients may be apparently healthy for many years but ultimately die from sequelae of hyperparathyroidism, even though the latter has been checked by parathyroidectomy. (3) A rise in blood pressure occurs in most cases of hyperparathyroidism. This is transitory at first then permanent and is an important reason for the poor prognosis. (4) Since early diagnosis and operation play a part in determining the prognosis, blood calcium and phosphorus levels should be investigated in all patients whose symptoms even remotely suggest hyperparathyroidism. (5) Parathyroidectomy is the only treatment that should be considered. Radiologic treatment is ineffective and ill-advised in that it delays operation. (6) In adenoma it usually suffices to remove the involved parathyroid gland. In diffuse hyperplasia sufficient parathyroid tissue should be removed, if possible, for the hypercalcemia to be cured without tetany being produced. However, even partial resection that does not eliminate the hyperparathyroidism completely may improve the patient's condition.

Respiratory Obstruction Due to Thymus.—A case of rapid growth of the thymus in an infant with severe respiratory obstruction is described. Transpleural extirpation gave complete freedom from symptoms. The removed thymus weighed 50 Gm. and showed a histologically normal picture. Probably the enlargement was due to rapidly progressing hyperplasia. No other case of equally rapid growth of the thymus has been found in the literature. It is one of the few cases in which an unquestionable connection has been established between thymus enlargement and respiratory difficulties in an infant. It is suggested that in such cases the symptoms may be due to the rapid growth of the thymus rather than to its actual size.

Küntscher's Medullary Nailing.—Lindvall reports the results of medullary nailing of fractures according to the technic of Küntscher in 40 patients. This technic, first described in 1940, consists in the insertion of a V-shaped nail of stainless steel longitudinally into the medullary cavity at a distance from the fracture and the driving of this nail along the canal until it bridges the fracture site. This is accomplished after an exact reduction has been made and virtually eliminates the risk of infection. It permits immediate active motion of the extremity. In practice the authors frequently found it necessary to do an open reduction and insert the nail at the fracture site under visual control. The width and length of the nail must be chosen carefully, since too thick a nail results in impaction and too short a nail results in instability. The author concludes that medullary nailing is the ideal method of treatment in closed as well as in complicated fractures of the femur in adults from the subtrochanteric region down to 10-15 cm. above the knee. In certain cases of fracture of the humerus and of the forearm it may be used to advantage, but it is not suitable in fractures of the lower leg. Since it is technically difficult it should be used only by those specially trained in surgery or orthopedics.

Acta Radiologica, Stockholm

34:145-246 (Sept.) 1950. **Partial Index**

Electrokymographical Studies of Coartation of Aorta. S. R. Kjellberg and U. Rudhe.—p. 145.
Film-Faults Caused by Contact Between Roentgen Films During Development. O. Mattsson.—p. 166.
*Platelet Values in Personnel Engaged in Roentgen Diagnostic Work. H. Mossberg.—p. 186.
*Roentgen Diagnosis of Tuberculous Salpingitis. K. Ekengren and A. B. V. Rydén.—p. 193.
Electrolytic Silver Recovery from Fixing Baths in Use. K. Heiberg.—p. 215.
Aberrant Pancreas. L. Kjellman.—p. 225.
Hemangioma of Vertebra Associated with Compression of Spinal Cord. O. Brøbeck.—p. 235.
Hysterography in Cancer of Corpus of Uterus. O. Norman.—p. 244.

Platelet Count in Personnel of Roentgen Department.—Mossberg made blood platelet counts on 24 persons who were doing diagnostic work with roentgen apparatus. Two or three counts were made on all these persons and the average was then determined. The corresponding leukocyte counts were also registered. Sixteen persons, who had done little or no radiologic work, served as controls. Seven of the 24 persons showed a definite decrease in the platelet count, and nine showed a questionable change. The remaining eight persons had normal platelet values. Among the seven persons with decreased platelets, there were four with questionable, and one with definite pathological changes in the white blood cell picture. In the nine persons who showed questionable changes in the platelets, one had definite, and one uncertain changes in the white blood cell picture. Three of eight persons with normal thrombocyte values showed changes in the white blood cell picture. The author believes that the platelet count should be an integral part of the routine blood control of personnel engaged in radiologic work. He admits that a platelet count is technically difficult, but stresses that, ordinarily, thrombocytes are resistant against factors such as fever, infection and exertion. A low platelet count in an otherwise healthy person in radiologic work must therefore be considered as a radiation effect. Changes in the white blood cells sometimes have other causes and require a more detailed investigation. The thrombocyte count is intended to complement the necessary routine blood examination of personnel in radiologic work.

Roentgen Diagnosis of Tuberculous Salpingitis.—The rarity of genital tuberculosis in women is only apparent, since in its commonest form, tuberculous salpingitis, it causes no subjective symptoms or changes detectable by palpation. Sterility is the symptom that brings the majority of these women to seek medical advice. Even if palpation indicates changes in the adnexa, the demonstration of the tuberculous nature of the lesion will require histological and bacteriologic studies. Magnusson, however, demonstrated that in many cases a probable diagnosis of tubal tuberculosis can be based on roentgenologic observations. In this report Ekengren and Rydén present observations on 75 patients with tubal tuberculosis who were roentgenologically examined and in whom the diagnosis was confirmed by the microscopic demonstration of tuberculous changes either in the tubes or in the endometrium. The control material consisted of 95 roentgenologically examined women with tubal sterility in whom subsequent operation and microscopic examination did not reveal tuberculous changes in the uterine tubes. After an initial frontal survey roentgenogram, a water soluble contrast medium was injected and both oblique and frontal exposures were made with the patient in the supine position. Between exposures and under fluoroscopic control more contrast medium was introduced. Then a lateral view and exposures with the patient on her side were made, to ascertain whether there was fluid in the tubes and how the contrast medium was moving in the pelvic cavity. The total amount of contrast medium was 20 to 30 milliliters. When tubal spasm caused a defective picture, an intravenous injection of a spasmolytic substance counteracted this. The authors filled surgically removed tubes with contrast medium, examined them roentgenographically and then fixed them for histological study. They differentiated six different types of salpingograms, which were more or less characteristic for tubal tuberculosis. The development of the tuberculous lesion was studied in 27 cases by repeated salpingograms. Tubal tuberculosis usually heals with shrinkage of the tuberculous tissue, which in most cases leads to multiple constrictions of the tubal lumen and finally to obliteration. Salpingography with a water soluble contrast medium entails little risk of an activation or spreading of the tuberculous process.

Deutsche medizinische Wochenschrift, Stuttgart

75:1675-1708 (Dec. 15) 1950. **Partial Index**

Noradrenaline as a Hormone of the Adrenals and the Sympathetic Nervous System. U. S. v. Euler.—p. 1675.
*Differential Diagnosis of Congenital Cyanosis. A. Schaede.—p. 1681.
Epidemiology of a Wave of Encephalitis in the Palatinate 1947-1949. R.-E. Bader and R. Hengel.—p. 1683.
*Question of Protein Therapy in Liver Diseases. P. Büchmann and H. Schulze-Buschoff.—p. 1685.
Penicillin in Treatment of Congenital Syphilis. P. Paul.—p. 1688.

Differential Diagnosis of Congenital Cyanosis.—Schaede found that the tetralogy of Fallot (pulmonary stenosis, defect in the interventricular septum, dextroposition of the aorta and hypertrophy of the right ventricle) accounted for 55 per cent of 160 cases of congenital cyanotic heart disease observed at his clinic. It was also the chief indication for the Blalock-Taussig operation, in which an anastomosis is made between the pulmonary and subclavian arteries. Fallot's tetralogy is not a nosologic entity, however, and if patients with this defect are to be operated on, a more detailed differentiation must be made with respect to three factors: the degree of pulmonary stenosis, the extent to which the aorta is displaced to the right side and the collateral circulation of the lung. The seriousness of the clinical picture is indicated by the degree of displacement of the aorta in relation to the septum. The collateral circulation of the lung is of vital importance in the choice of operative technic, because, in cases of extensive collateral blood perfusion of the lung, the pulmonary artery may be entirely atresic, rendering surgical treatment impossible. Angiocardiographic studies are required, because there are no clear clinical signs of the collateral circulation. Atresia of the tricuspid valve is of relatively frequent occurrence and cannot be clinically differentiated from Fallot's tetralogy, but angiocardiographic examination is a diagnostic aid. The clinical symptoms of Eisenmenger's complex also resemble those of Fallot's tetralogy, and here again

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angiocardiographic studies will aid in the differentiation. The author also describes the aspects of pure pulmonary stenosis.

Protein Therapy in Liver Disease.—Although high protein diets and the amino acids, methionine, cystine and choline have been widely recommended for the treatment of liver diseases, they do not seem uniformly effective. The authors studied 25 patients with liver disease, selecting for treatment only those who during a preliminary period of observation showed no spontaneous decrease in the bilirubin content of the blood. The majority had hepatitis of moderate severity. In addition to the customary treatment for hepatitis, which included a diet with a high carbohydrate content and the oral administration of dextrose, they were also given daily 3 Gm. of methionine, partly by mouth and partly intravenously. A fish protein preparation, containing a mixture of 22 amino acids, including methionine and cystine, was given in order to increase the protein content of the diet. Hormones of the adrenal cortex were given for the purpose of normalizing mineral metabolism and improving the intermediate protein metabolism in the liver. The authors concluded that treatment with methionine and protein was no more effective than treatment with hormones of the adrenal cortex alone. The authors feel that at least in the acute cases of hepatitis high protein diets should be used cautiously. Recently, investigators in Switzerland and in the Anglo-Saxon countries have warned against use of large amounts of protein in acute liver diseases. From 50 to 60 Gm. of protein per day has been estimated as an adequate amount, and it has also been suggested that protein be given chiefly in the form of milk protein (cottage cheese, 200 to 300 Gm. daily). Chronic diseases of the liver, however, are apparently different in this respect, and the authors believe that with a high protein diet and the addition of lipotropic amino acids it will be possible to increase the life expectancy of patients with hepatic cirrhosis, producing clinical improvement and perhaps even cures.

Journal de Médecine de Lyon

31:991-1036 (Dec. 5) 1950. **Partial Index**

*Indications for Parathyroidectomy, Particularly in Cases of Chronic Rheumatism. P. Mallet-Guy and P. Guigou.—p. 991.
Recovery from Inflammatory Complications and Suppurations of Mammary Glands Due to Lactation, Obtained with Aureomycin. E. Bansillon and H. Gabriel.—p. 1001.
Cancer of Subcardiac Segment of Lesser Curvature of Stomach. A. Vachon, P. Maillet and P. M. Noel.—p. 1005.

Indications for Parathyroidectomy.—Mallet-Guy and Guigou performed parathyroidectomy for von Recklinghausen's disease, scleroderma and painful vertebral osteomalacia due to vitamin deficiency in six patients and for chronic rheumatism in 33 patients. Only temporary improvement resulted from the operation in the patients with von Recklinghausen's disease and scleroderma; immediate and prolonged relief from pain resulted in two of three patients with osteomalacia, and there was complete recovery five months after the operation in the third. Unilateral parathyroidectomy proved highly effective in the treatment of vertebral arthritis with hypercalcemia or with serum calcium levels at the upper normal limit. Parathyroidectomy was effective in degenerative arthritis of the vertebrae and had the double advantage of immediate and lasting effects when compared with other methods of treatment for this syndrome. Parathyroidectomy may be therapeutically effective in inflammatory rheumatism with a progressive course. Parathyroidectomy proved of significant aid in treatment of spondylarthritis and spondylitis rhizomelica, and is the only means of obtaining rapid and permanent recovery from such refractory disease. Although parathyroidectomy seems to exert a selective effect on vertebral arthritis, it has only an inconstant effect on the pain in the joints of the extremities. When successful, the operation produces immediate and lasting decrease in the previously elevated blood calcium level of patients with vertebral arthritis. Parathyroidectomy failed in patients with low blood calcium level. Microscopic examination of the removed parathyroids rarely revealed signs of hyperactivity of the glands and never showed pathological changes. Results suggest that unilateral parathyroidectomy is indicated for treatment of rheumatoid polyarthritis with vertebral localization in the presence of hypercalcemia.

Schweizerische medizinische Wochenschrift, Basel

80:1325-1348 (Dec. 16) 1950. **Partial Index**

Death from Bronchial Asthma. G. Riva and R. Probst.—p. 1325.
*Hyperparathyroidism and Gastroduodenal Ulcer. P. Läuchli.—p. 1332.
Short Waves and Renal Function. F. Reubi and J. Hohendorf.—p. 1335.

Hyperparathyroidism and Gastroduodenal Ulcer.—Läuchli reports six cases of primary hyperparathyroidism in which necropsy was performed. A gastroduodenal ulcer was revealed in five cases, and a duodenal carcinoma was observed in the sixth case. An increased incidence of ulcer could not be demonstrated in cases of secondary hyperparathyroidism. Clinical diagnosis of hyperparathyroidism was made in only one of the six cases, in which osteitis fibrosa cystica was predominant. Bone changes were mostly insignificant in the other cases. Calcium nephrosis was observed in four cases, and nephrolithiasis was also present in one of them. Death resulted from contracted kidney in this latter case. Clinical diagnosis of peptic ulcer was made only in two cases, with death resulting from massive hemorrhage in one of them. In the light of these observations, the concept of Rogers and his co-workers that hyperparathyroidism may be related to the ulcer diet high in calcium seems unlikely. Likewise, it is doubtful whether hypercalcemia and the excess of parathyroid hormone can be considered as etiological factors in the pathogenesis of ulcer. Calcium metastases in the gastric mucous membrane definitely do not play a part in the pathogenesis of ulcer. There is no satisfactory explanation for the pathogenesis of gastroduodenal ulcer associated with hyperparathyroidism.

Ztschr. Hygiene & Infektionskrankh., Heidelberg

131:555-670 (Oct. 31) 1950. **Partial Index**

Demonstration of Antihemagglutinins as Diagnostic Aid in Patients with Variola. W. A. Collier, A. M. Smit and A. F. v. Heerde.—p. 555.
Epidemic of Leptospirosis Designated as Field or Harvest Fever Among Workers Harvesting Peas: Epidemiology of Field Fever. L. Popp.—p. 575.
*Modification of Absolute Leukocyte Count by Exposure to Cold in Persons Predisposed to Colds. G. Wildführ.—p. 605.
Demonstration of Paternity. M. Lönns.—p. 609.
Question of Skin Tolerance for New Detergents. H. Adamek and D. Hampel.—p. 617.
Mass Food Poisoning by Salmonella Enteritidis Breslau Var. Binns. L. Popp and W. Westphal.—p. 626.
Sodium Thioglycollate Bouillon, a Fluid Culture Medium for Anaerobic Organisms. D. O. Schmid.—p. 631.
Spectrographic Determination of Lead in Drinking Water and Blood. G. Schrader.—p. 636.

Modification of Leukocyte Count by Exposure to Cold.—In an earlier investigation Wildführ was able to demonstrate that the bactericidal as well as the opsonic capacity of the blood was reduced under the influence of cooling experiments to a much greater extent in those predisposed to colds than in those not so predisposed. A predisposition to colds is manifested by frequent catarrhal colds and by an instability of the thermoregulatory capacity, which is revealed by retarded rewarming after direct cooling and by the easy elicitation of vascular spasm during indirect cooling. Persons not predisposed to colds have a good thermoregulatory capacity; that is, they show rapid recovery after direct cooling and minimal reflex vascular response to distant cooling. In this report Wildführ studies the effect of cooling on the leukocyte count. Of 71 persons tested, 41 were susceptible to colds. Three different methods were used to induce cooling. Those in group A inhaled cold air (between — 5 C. and + 2 C. [23 to 35 F.]); those in group B were given an ice collar for 30 minutes and those in group C a 30 minute foot bath in water of 8 C. (46.4 F.). Temperature recordings and leukocyte counts were made before, during and for six hours after the cooling experiments. The absolute leukocyte number decreased by 40 to 70 per cent as the result of the cooling in those predisposed to colds, whereas in those not predisposed the decrease was rarely higher than 30 per cent. Furthermore, this reduction in leukocytes persisted from two to three times longer in predisposed persons.

BOOK REVIEWS

Encyclopedia of the Eye: Diagnosis and Treatment. By Conrad Berens, M.D., F.A.C.S., Executive Eye Surgeon, New York Eye and Ear Infirmary, New York, and Edward Siegel, M.A., M.D., Attending Ophthalmologist, Champlain Valley Hospital, Plattsburg, New York. Cloth. $5. Pp. 272, with 76 illustrations. J. B. Lippincott Company, 227-231 S. 6th St., Philadelphia 5; Aldine House, 10-13 Bedford St., London, W.C.2; 2083 Guy St., Montreal, 1950.

The authors are eminently qualified to prepare such a text. They indicate that the book is written as a ready reference to the diagnosis and treatment of the commoner ophthalmological problems. However, they have made no attempt to delete many of the obsolete practices that continue to appear in many so-called modern textbooks. Such are the relation of errors of refraction to abscess of the lid and conjunctivitis, use of mild silver protein (argyrol®) and yellow mercuric oxide as antiseptics, the inclusion of keratoconus and megalocormnea under congenital anomalies and discussion of reading disabilities without any reference to the modern progressive method of teaching. References are few and are mostly directed to work done by the senior author. Special sections are devoted to both pediatric ophthalmology and drugs. The text is said to have been prepared as part of the program of the Ophthalmological Foundation, but there is no further description of the basis of this organization.

The format and type are excellent, and the illustrations are good except that they are all concentrated at the middle of the volume; they would be more useful if placed with the condition they pertain to. The general approach is clever, and it is to be hoped that the authors, who plan to revise this text from time to time, will make improvements.

German Aviation Medicine World War II. Volumes I and II. Prepared under auspices of Surgeon General, U. S. Air Force. Cloth. $4.25 each; $8.50 per set of 2 volumes, Pp. 648; 649-1302, with illustrations. Supt. of Doc., Government Printing Office, Washington 25, D. C., 1950.

At the close of World War II in Europe, the United States Air Forces organized and directed a group of experienced flight surgeons to obtain firsthand information on the scientific accomplishments of Germany in the field of aviation medicine. Special teams of experts visited nearly every university, laboratory and military installation where research in support of the Luftwaffe had been conducted. Many of these installations had been partially or completely destroyed by bombing; others had ceased operations or had been dispersed to areas of relative safety. The project was not easy, because research data and developments were scattered widely; countless documents had been lost, and the information obtained often was fragmentary and difficult to evaluate.

A plan was finally formulated and executed under the direction of Major General Malcolm C. Grow, USAF, to establish an aeromedical center at Heidelberg. This attracted a group of leading German aeromedical research workers who wished not only to complete their own research but to bring together and organize the mass of material that had accumulated in this field prior to and during the war. The outcome was a coherent record of German wartime achievement in aviation medicine. These two volumes represent the work of 56 specialists, who divided the contents into 14 major parts. The individual chapters differ widely in their approach; some are detailed and others contain material that is long out of date. There are ample descriptions of novel and ingenious technics and instruments and innumerable illustrations, graphs, diagrams and photographs of apparatus.

The first volume gives a brief historical sketch of German aviation along with the development of German military aircraft. Much space is devoted to research on high altitude physiology, with chapters on altitude tolerance, acclimatization, decompression sickness, explosive decompression and the pathology of anoxia in man and animals. An entire chapter is devoted to oxygen equipment, breathing masks, pressure suits and pressure cabins. The second volume starts with physics and the physiology of man's reaction to sound and vibration in aircraft. This is followed by reports of work done on the problems of cold and heat and a discussion of protective clothing. The complexities of visual problems and the importance of the eyes in aviation are given much space. The ears, sinuses, vestibular apparatus and the larynx are discussed at length. Another part is entitled "Emergency Procedures," with several chapters on the organization, equipment and procedures of air evacuation of the wounded and air-sea rescues. Thirst and its control are also described. The final section deals with blasts and the effects on the human body of explosions in the air and under water.

Aviation medicine is a tremendous subject, and, although there are some duplications, the topic is well covered in these volumes. The lack of organization is more than compensated for by the fact that the editors accomplish their purpose. These volumes should prove valuable to research workers in aeromedicine and to all those who wish to be better informed on this subject.

Injuries to the Ankle. By J. Grant Bonnin, M.B., B.S., F.R.C.S., Orthopædic Surgeon, Central Middlesex Hospital, London. Cloth. $9.75. Pp. 412, with 399 illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1950.

Books have been written to describe the anatomy, physiology, or diseases of the eye, ear, nose, foot, shoulder and other organs or regions of the human body. This seems to be the first reference book confined entirely to the ankle. According to the author, the ankle is second in importance only to the knee. The emphasis placed on this important articulation is justified.

The book is beautifully written and adequately illustrated. The chapter entitled "Historical Survey" is interesting and informative. The anatomy of the ankle joint is portrayed in several color plates, as well as by the more commonly used line drawings. The mechanism of fractures of the bones that make up the ankle joint is extensively discussed. The technic of making roentgenogram examinations of the ankle is combined with clearly stated descriptions of the diagnostic findings portrayed in roentgenograms. Injuries of the ligaments that support the ankle and the methods of dealing with these lesions are also fully discussed. The text is confined for the most part to those lesions produced by trauma, and it should be a valuable addition to the library of every physician whose interest includes the diagnosis and treatment of fractures, sprains and dislocations.

Current Therapy 1951: Latest Approved Methods of Treatment for the Practicing Physician. Editor: Howard F. Conn, M.D. Consulting Editors: M. Edward Davis, and others. Cloth. $10. Pp. 699. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C.2, 1951.

This book on treatment of diseases has 16 sections. Section 1 takes up the treatment of infectious diseases, section 2 the treatment of diseases of the respiratory system. The various other categories of diseases are covered in the sections up to section 15, which concerns diseases due to physical and chemical agents. Section 16 gives additional data on the numerous drugs mentioned in this volume including a table of appropriate equivalents in the metric and apothecaries' systems. The methods of treatment given for the numerous diseases are brief and to the point and were written expressly for this volume. These methods are those in current use. The contributor's name in each case does not imply that he was the originator of a particular treatment. About 275 clinicians have written these brief articles each representing the opinion of a recognized authority. This book should be of great interest and help to all busy practitioners of medicine.

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

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Experimental Physiology with Anatomical and Mechanical Illustrations and Appendix of Technical Data. By Maurice B. Visscher, Ph.D., M.D., Professor and Head of Department of Physiology, University of Minnesota, Minneapolis, Ernest B. Brown, Ph.D., Assistant Professor, Department of Physiology, University of Minnesota, Minneapolis, and Nathan Lifson, M.D., Ph.D., Professor, Department of Physiology, University of Minnesota, Minneapolis. New edition. Paper. $2.75. Pp. 126, with 46 illustrations. Burgess Publishing Company, 426 S. 6th St., Minneapolis 15, 1950.

This book gives directions for laboratory work in physiology for medical students. It includes experiments on blood, circulation, respiration, muscular and nervous activity, sense organs, digestion, metabolism and excretion. Many of the experiments are to be done on human subjects, namely, the students themselves; others apply to various experimental animals including dogs. The directions given for humane care and anesthesia in animals are detailed and emphatic; other writers of laboratory manuals might do well to include similar statements regarding the ethical and technical problems of animal experimentation. An appendix gives some useful information; especially helpful are the dosages of various drugs and the concentrations of much-used solutions. The book is attractively printed, has some good illustrations and is bound in such a way that it will lie open on the work table.

As a document indicating the status and trend of medical education, this book calls for further comment. Good laboratory courses are much harder and more expensive to give than good lectures, yet there are indications that the more mature members of the faculty devote themselves mainly to lecturing, while the younger men are left to struggle with problems of laboratory teaching. This may be the explanation of the fact that this book is so commendably free from minor faults and so seriously affected by major ones. There is, for example, no more important concept in modern biology than that of the "controlled experiment," the type of experiment in which comparisons are made between two series of observations, a test series, in which some particular stimulus is applied or condition created, and a control series, in which all extraneous circumstances are duplicated as nearly as possible while only the particular stimulus or condition is omitted. It is unfortunate, of course, that the word "control" has been chosen to serve in this highly specialized way in scientific writing, for the general public, including the manufacturers of medical supplies, reads the constant admonitions about the need of controlled experiments without suspecting that the word is being used in a very arbitrary, special sense. It is even more unfortunate that scientists are not always aware of this semantic trap. In this laboratory manual, the word "controlled" occurs four times on pages 1 and 2, always in the wrong sense. It is hoped that future editions will remedy this.

Similarly, there has been complaint that current textbooks of physiology ignore the possibilities of experimental psychology. Medical students sometimes show a disconcerting lack of finesse in planning human experiments in which such factors as suggestion and relaxation are likely to affect the results. Experiment 87, on basal metabolic rate, could easily be done in a way that would illustrate the technic of progressive relaxation and at the same time open the eyes of the student to a frequent cause of error (incomplete relaxation) in basal metabolic determinations. Other representative experiments from the field of physiological psychology would be beneficial. Another important field is biophysics. In any medical school where there is no separate course in this subject, the physiology course should exclude everything it can safely abandon to the biochemistry course and should incorporate as much as possible of biophysics, including the groundwork of physical medicine.

Finally there is the matter of logic and statistics. The authors pay lip service to this on page 9, where the student is advised to review the "use of statistical methods," but there are no indications elsewhere in the book that the authors appreciate the value of listing combinations and permutations, calculating probabilities, determining the reliability of measurements by the test-retest method, demonstrating correlations or defining normal variability. These experiences can open the eyes of a student to the real meaning of blood cell counts, for instance, and to the relative dependability of systolic and diastolic blood pressure readings. Many such things can be done with no added expenditure of time or material by the students provided an energetic teacher organizes, posts and analyzes the results from the whole class.

In the section on color blindness the authors recommend the use of the Ishihara charts, which ought to have been discarded long ago. This section also exemplifies the older helpless attitude that the colorblind should be exposed and eliminated from various occupations, instead of the modern policy of searching for and using those color contrasts that can be recognized by the greatest possible number of people. Among other antiques in this book is one passage harking back at least to the 1918 edition of the textbook by G. N. Stewart. One can only hope that medical educators will soon awaken to the fact that modern students deserve modern pedagogy and that the writing of a laboratory manual is a problem worthy of the closest attention of the best teachers.

Worth and Chavasse's Squint: The Binocular Reflexes and the Treatment of Strabismus. By T. Keith Lyle, C.B.E., M.A., M.D., Surgeon and Medical Officer in Charge of Orthoptic Department at Westminster Branch of Moorfields, Westminster and Central Eye Hospital, London. Eighth edition. Cloth. $8. Pp. 319, with 208 illustrations. The Blakiston Company (Division of Doubleday & Company, Inc.), 1012 Walnut St., Philadelphia 5, 1950.

Worth's classical treatise on extraocular muscle anomalies, revised some 10 years ago by Chavasse, has again been revised and partly rewritten by Lyle. The present author has attempted to simplify and clarify the text while at the same time adding much of the newer concept of strabismus. The book still requires careful reading for complete understanding, but the persevering student will be rewarded for his effort.

Strabismus is regarded as a perversion of the normal binocular reflex due to various obstacles. After a consideration of the development of binocular vision phylogenetically, the nature of the motor and sensory obstacles is considered, with special emphasis on the development of such changes as secondary retinal correspondence of various types. The place, but not the detailed technic, of orthoptic treatment is discussed, and in this phase a sane, middle-of-the-road attitude is exhibited. The indications for surgical intervention are emphasized, together with some discussion of types and technical details of operations. The ophthalmological world is richer for this edition of what has undoubtedly been the most authoritative work on the subject of squint. Printing, paper, illustrations and content are all of the highest caliber. This book belongs in the library of any reader with an interest in this important phase of ophthalmological practice.

Hirndurchblutungsstörungen: Ihre Klinik und arteriographische Diagnose. Von A. Brobeil, Dozent an der Uniersitäts-Nervenklinik Marburg-Lahn. Cloth. 45 marks. Pp. 264, with 84 illustrations. Georg Thieme, Diemershaldenstrasse 47, (14a) Stuttgart O; Agents for U. S. A.: Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1950.

Since cerebral angiography has been more readily available with percutaneous technics, Brobeil has found it of ever increasing value in clinical neuropsychiatry, especially in elucidation of the problems of cerebral circulation, with which this book is concerned. After describing the physiology, pathophysiology and pharmacology of the general cerebral circulation, the author describes the syndromes of occlusion of individual cerebral vessels. Angiograms are reproduced (with reversed densities) to illustrate occlusions of internal carotid and middle cerebral arteries, and descriptions of the films are included to facilitate angiographic diagnosis. The conventional drugs and minor operative procedures used in combating the effects of cerebral thrombosis are given, as well as recommendation of ligation of the external carotid artery to increase internal carotid circulation by way of the middle meningeal reflex. Transient disturbances in circulation "Gefässkrisen" accompany intracerebral disease, but Brobeil doubts that cerebral vasospasm exists in the absence of such disease. His concept of the mechanism of migraine (and hence its treatment) is somewhat at variance with the views proposed by Wolf and Wolfe. Epilepsy is again considered to be intimately related to disturbances in cerebral circulation, but not in subcortical structures (perhaps the diencephalon). There is an unusually detailed and documented expo-

sition of the clinical and angiographic findings in cerebral thromboangeitis obliterans. A series of plates of normal angiograms from patients of various ages precedes a section on angiographic diagnosis of cerebral arteriosclerosis. Textual references imply that thorotrast* (a colloidal suspension of thorium dioxide) is the contrast material used in the angiography; there is no reference to the complications from use of this material or to the possible dangers of use of the more irritating iodopyracet compounds in the presence of intrinsic vascular disease of the cerebrum. The almost complete lack of illustrations of the circulation of the posterior fossa and brain stem may be a reflection of the fact that the book was written in 1948, before the advent of reliable percutaneous vertebral angiography.

The book is well printed; the illustrations are good, although the minutiae on which differential diagnosis of endarteritic phenomena depends are often invisible. The text is clearly written. It should provide valuable information for the neurologist interested in cerebral circulation, although the general practitioner, for whom it was in part intended, will probably have little occasion to use it.

Handbook of Child Health. By Austin Furniss, L.R.C.P., L.R.C.S., L.D.S., Chief Assistant School Medical Officer, West Ham. Cloth. 25s. Pp. 280. Sylviro Publications, Ltd., 19 Welbeck St., London, W.1, 1950.

The health status of school age children in England, particularly in London, is reviewed in considerable detail with suggestions of administrative procedures that might be used in further improvement of child health. The author considers nutrition an extremely important factor and outlines in detail researches that have indicated the shifts of the nutritional status of children over a period of two decades.

The importance of nursery schools as a preliminary training for later school experience is stressed, with particular emphasis on the improved physical status resulting from feeding programs associated with them. Little discussion is given to the normal child, but at least two thirds of the volume is concerned with the problems of abnormal children, including those who are maladjusted, those with various types of physical and emotional problems, the mentally retarded, the deaf and the blind.

The point of view expressed about the school health program is considerably different from the attitude of American physicians toward the health programs in the schools with which they may be associated. Though this book is an interesting discussion of the pathology that may be encountered in children of school age, it gives so much emphasis to pathology and so little emphasis to the maintenance of good health that it would be useful only as a reference volume for American school physicians. Continuous reference is made to numbered forms that are part of the British medical service program which may be unintelligible to American readers.

Diagnostic Procedures and Reagents: Technics for the Laboratory Diagnosis and Control of the Communicable Diseases. Third edition. Cloth. $6. Pp. 589, with illustrations. American Public Health Association, Inc., 1790 Broadway, New York 19, 1950.

Primarily intended as a guide to the laboratory worker, this book represents more than a mere manual of procedures, since it includes explanations of the principles underlying the methods described. At times the clinical aspects of the disease have been included in the discussion to guide laboratory personnel in the collection and handling of appropriate specimens. The bulk of the book is of most interest to technicians in clinical laboratories. The treatment of such technical material is commendable in that it has been made comfortably readable.

There are many interesting observations prefacing the technical discussions. For example, there is the note that the laborious typing of pneumococci is no longer necessary with the advent of the various antibiotics. Colored plates showing the various stages in the life history of the malaria parasites are a new addition in this edition and are a visual aid to the microscopist to be used in their identification. Three new chapters have also been added in this edition: Leptospira Infection (Weil's disease), Technic of Rh Testing, and Antimicrobial Assays: Bacterial Response and Level Determinations in Body Fluids.

The Velpke Baby Home Trial: Trial of Heinrich Gerike, Georg Hessling, Werner Noth, Hermann Müller, Gustav Claus, Richard Demmerich, Fritz Flint, Valentina Bilen. Edited by George Brand, LL.B. With foreword by Professor H. Lauterpacht, K.C., LL.D., F.B.A., Whewell Professor of International Law in University of Cambridge, Volume VII, War Crimes Trials, General Editor: The Right Hon. Sir David Maxwell Fyfe, K.C., M.P. Cloth. $4.25. Pp. 356. William Hodge and Company, Ltd., 86 Hatton Garden, London, E.C.1; 12 Bank St., Edinburgh 1; British Book Centre, Inc., 122 E. 55th St., New York 22, N. Y., 1950.

This book, one of a series devoted to reporting war crime trials, deals with the trial of a physician and several laymen jointly charged with the unusual crime of "killing by wilful neglect." All defendants were, in one capacity or another, connected with the operation of a nursery home where children of slave laborers were kept and where 96 children died of diarrhea, dysentery or malnutrition in a period of eight months.

The book actually has two parts: the introduction, an excellent essay discussing the reasons for and aspects of war crime trials, and the report of the trial itself, an abstract of the evidence of the trial. The introduction answers many common questions concerning the right of the victor to try the vanquished, discusses precedent and explains procedures. It points out the unusual nature of the crime forming the basis of this trial and explains adequately for a lay reader the proceedings that led to the conviction of the physician and most of his co-defendants.

The abstract of evidence, rather dry and formal, gives a picture of life in one section of Germany after the tide of battle turned. It indicates that medicine for the good of all the people suffered under military or Nazi party direction. Of special interest is the cumulative evidence against the physician in support of the allegation of wilful neglect. Mostly circumstantial, the evidence tended to show that he knew of conditions in the nursery home that were responsible for the high mortality rate yet took no affirmative action to correct those conditions. Although the book cannot be easily or quickly read, it may be read a little at a time without losing its effectiveness.

Visual Anatomy: Head and Neck. By Sydney M. Friedman, M.D., Ph.D., Professor of Anatomy, University of British Columbia, Vancouver, Canada. Cloth. $6.50. Pp. 217, with 88 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 49 Broad St., Oxford, England; The Ryerson Press, 299 Queen St., W., Toronto 2B, 1950.

This book is described by the publishers as a visual text, in which facts are presented largely by illustrations and only secondarily by the written word. It contains line drawings executed by the author and covers such regions and structures as the anterior, lateral and posterior aspects of the neck, the suprahyoid, submandibular and parotid regions; the orbit, nose and auditory apparatus; the cervical viscera, and the skull. Each illustration is accompanied with a facing page of text that carries a brief description of the important structures, with emphasis on functional and clinical significance. Since the book is intended as a review text for advanced and postgraduate students, latitude in respect to order of presentation could be exercised. Thus the basic framework of the head and neck is first presented, an order that would be confusing to the beginner, since gross dissection requires the more illogical approach of starting from the outside and working inward. This brief text should prove welcome to the student faced with the necessity of reviewing gross anatomy. It is to be hoped that volumes dealing with other regions of the body will be forthcoming and that the series will be available at a price within the range of the student's pocketbook.

Augenheilkunde für praktische Ärzte und Internisten. Von Dozent Dr. Franz Fischer. Cloth. $5.70. Pp. 218, with 81 illustrations. Wilhelm Maudrich, Spitalgasse 1b, Wien 1X/2, 1951.

The author of this textbook for the general practitioner and the internist is well qualified to write on this subject by his long association with Professor Josef Meller. The book is outstanding in its simple, schematic line drawings and color plates, excellent printing and logical simplicity. A generous index is included but no bibliography. However, since it is in German, it will have limited usefulness for the American physician.

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The New You and Heredity. By Amram Scheinfeld. With special editing in medical genetics sections by Dr. Morton D. Schweitzer, and additional aid by others herein mentioned. [Second edition of "You and Heredity."] Cloth. $5. Pp. 616, with illustrations. J. B. Lippincott Company, 227-231 S. 6th St., Philadelphia 5; Aldine House, 10-13 Bedford St., London W.C.2, 1950.

A delightful experience in the more popular side of medicine awaits any physician who reads Dr. Sheinfeld's new book on heredity. Though this book is obviously written for the intelligent layman who has had high school biology, it contains much material that would review and enrich the physician's current knowledge of the workings of the genes and chromosomes.

The greatest value of this book is that it puts technical information into simple, understandable language that can be used by the physician in explaining the problems of heredity to his patients. The excellent illustrations and the understandable examples used to explain complicated technical information lend themselves to the patient-physician consultation. In any physician's practice, patients will ask about the possibilities of heredity, and in this book Dr. Sheinfeld explains simply and with much wit the transmissions of such characteristics as eye color, hair color, skin color, facial features and physical size and shape. He explains multiple births in such a way that the parents of twins or triplets can be given an excellent picture of what happens. He discusses the inheritance of blood groups and particularly the important Rh factor and what might be done to make its effect less troublesome to young wives who are Rh negative. Much space is given to the "black genes" and the effect that they can have in the production of deformity and disease when certain gene patterns are united. Though the area of intelligence, behavior and personality are still a hereditary question mark, he discusses them in an attractive way, giving the information from both the hereditary and the acquired characteristics point of view. He finishes the book with a discussion of evolution, with the possible origin of races, and assumes the role of prophet in looking to the future to see if we will continue to be as we are or if there is in our hereditary pattern evidence to indicate further evolution.

This is a most delightful and easily read book, and those who become interested in the subject can read further in the volumes listed in a generous bibliography, which gives special designation to those volumes that have been written especially for laymen or would be within their understanding.

The Neurologic Examination: Incorporating the Fundamentals of Neuroanatomy and Neurophysiology. By Russell N. DeJong, M.D., Professor of Neurology and Chairman of Department of Neurology, University of Michigan Medical School, Ann Arbor. Cloth. $15. Pp. 1079, with 368 illustrations. Paul B. Hoeber, Inc. (Medical Book Department of Harper & Brothers), 49 E. 33rd St., New York 16, 1950.

This textbook is a monumental tome divided into 10 parts and 61 chapters. The first six parts cover the methods of history taking and examination of the sensory system, cranial nerves, motor system, reflexes and autonomic nervous system. Part 7 is devoted to diagnosis and localization of lesions in the cord roots and nerves, and part 8 to diagnosis and localization of intracranial disease. Special methods of examination in the states of disordered consciousness is discussed in part 9 and the cerebrospinal fluid in part 10.

The discussion of the anatomy, physiology and methods of examination is thorough and excellent. Disease entities, clinical syndromes and pathology are not considered as a whole but are mentioned only as they relate to some abnormality of function of the portion of the nervous system under discussion. This arrangement of the material, as well as the lack of any consideration of therapy, does not permit this to be used as a textbook of clinical neurology. It is especially valuable as a reference guide for the student, intern or resident in neurology who wants to know all the facts with respect to the anatomy, physiology, methods and results of examination of various portions of the nervous system.

The book is well printed, and the illustrations are clearly reproduced and are well chosen. There is a fairly large list of general references at the end of the book and a list of special references for each chapter, with a good index. The author's purpose was to write a textbook that would serve as a practical guide to students and practitioners of medicine in the essentials of the neurological examination and the fundamentals of clinical neurology. The size of the book, and incidentally the cost, is apt to overwhelm the student and the practitioner and give the impression that neurology is an esoteric field that is best left to the specialist. This is unfortunate, because neurology as a branch of internal medicine is no more complicated than cardiology or gastroenterology.

Cerebral Angiography. By P. Almeida Lima, Professor of Neurology, Lisbon Faculty of Medicine, Lisbon. With introduction by Egas Moniz. Foreword by Sir Hugh Cairns, K.B.E., D.M., F.R.C.S., Nuffield Professor of Surgery in University of Oxford. Cloth. $8.75. Pp. 221, with 181 illustrations. Oxford University Press, 114 5th Ave., New York 11; Amen House, Warwick Sq., London, E.C.4, 1950.

The increasingly widespread usage of cerebral angiography makes this book particularly valuable at this time. The volume will serve as an excellent introduction for the radiologist or neurosurgeon without previous experience with the technic and interpretation of this diagnostic method. It will also be of value as a reference handbook for those already familiar with the subject. The author has had much experience with cerebral angiography (dating from 1926-1927) and has drawn from a wealth of clinical material. The first half of the book treats of the history of angiography, the technic recommended and the appearance of the normal cerebral circulation and the last half with the various pathological lesions found by means of cerebral angiography. The chapter on the normal angiogram and the account of the vascular arrangements encountered in various types of intracranial tumors are particularly valuable. The possible variations of angiographic technic are not well covered, despite the fact that many authorities differ with the author's technical methods. It is unfortunate that some of the roentgenograms have lost their fine detail through reproduction, but this is at least in part compensated for by excellent diagrams.

Analytical Chemistry of the Manhattan Project. Editor-in-Chief: Clement J. Rodden. Editors: N. Howell Furman, and others. National Nuclear Energy Series, Manhattan Project Technical Section, Division VIII—Volume I. Cloth. $6.75. Pp. 748, with illustrations. McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 18; Aldwych House, Aldwych, London, W.C.2, 1950.

This book represents a departure from the other volumes in the National Nuclear Energy Series, inasmuch as it is the first book in which related work from all the installations of the War Department's Manhattan Project is compiled. The compilation of the material must have assumed herculean proportions, and the editors deserve an accolade for the splendid integration of the material.

The text is divided into two parts. The first deals with the analytical chemistry of various elements, especially the chemistry of uranium and thorium. The remaining chapters of this section deal primarily with the determination of traces of the other elements in various materials. The second part is devoted to developments on certain analytical methods, including photometric, electrometric, spectrochemical, low pressure and radiochemical. There are numerous diagrams of the apparatus used, and references to the original papers are made at the end of each chapter. The book will appeal chiefly to the chemist. It is doubtful that the practicing physician will find anything of interest here.

Introducción al estudio de los insectos. Por Pablo Cova García. Publicaciones de la División de malariología, número 9. Paper. Pp. 141, with 133 illustrations. Ministerio de sanidad y asistencia social, Caracas, Venezuela, 1950.

This is a technical manual on the general morphology, reproduction and metamorphosis of insects, together with a standard classification beginning with subclasses and ending with suborders or, in the case of some medically important groups, with families. Both the general sections and the more special portions are generously supplied with well labelled line drawings. A key to classification follows the main text, and a short bibliography concludes the presentation. The publication should be useful to students of college level who desire essential information on the structure of insects and the characters that serve to identify them. It also constitutes a valuable prerequisite for persons interested in taking more specialized training in medical or economic entomology.

QUERIES AND MINOR NOTES

USE OF PENICILLIN IN VENEREAL DISEASE

To the Editor:—*What is the consensus on the use of penicillin as prophylaxis in venereal disease? Is there any difference in results obtained with parenteral and oral administration of penicillin? What is the optimum time after exposure for the use of this prophylaxis? Does the prophylactic treatment mask the early detection of syphilis?* *M.D., Arizona.*

Answer.—Alexander and Schoch are convinced that syphilis and/or gonorrhea can be prevented by injection of delayed absorption penicillin in one buttock and bismuth ethylcamphorate in the other (Prevention of Syphilis, *Arch. Dermat & Syph.* **59**:1 [Jan.] 1949; Abortive Treatment of Syphilis: Results Obtained in the Incubation, Primary and Secondary Stages of Syphilis, *Am. J. Syph., Gonor. & Ven. Dis.* **33**:429 [Sept.] 1949; The Treatment of Primary and Secondary Syphilis with Four New Schedules, *Am. J. Syph., Gonor. & Ven. Dis.* **34**:420 [Sept.] 1950). Originally, they used, in addition, 50 to 60 mg. of dichlorophenarsine hydrochloride. This was omitted for simplification of the prophylactic treatment, without the effectiveness of the treatment being sacrificed. The administration of 1,200,000 units of delayed absorption penicillin (procaine penicillin with 2 per cent aluminum monostearate added) and 3 cc. of bismuth ethylcamphorate at any time before the clinical development of syphilis prevented syphilis from developing in persons known to have been exposed to infectious syphilis. They further demonstrated that this was an acceptable and effective treatment for seronegative and seropositive primary syphilis and relatively effective in the treatment of frank secondary syphilis, thereby showing that abortive treatment must of necessity be effective in the incubation stage and also showing that its effectiveness in the incubation stage should not be altered by the length of time that has elapsed since exposure to infectious syphilis. Whether this treatment represents the consensus on the use of penicillin as a prophylaxis in veneral diseases is a matter of opinion rather than fact and is more dependent on the time required for the medical profession in general to accept new methods in the treatment of any disease. There are still some physicians who do not realize that penicillin is the treatment of choice for syphilis.

The oral use of penicillin in contradistinction to the use of delayed absorption penicillin by the intramuscular route was probably first suggested by Harry Eagle, but its value is still unproved. On hypothetical grounds, it should be effective, particularly when administered shortly after the exposure. Its limitations and dosage are undefined at present; it therefore cannot be recommended as preventive treatment for syphilis in humans. The abortive treatment of syphilis mentioned above, namely, 1,200,000 units of procaine penicillin with 2 per cent aluminum monostearate in one buttock and 3 cc. bismuth ethylcamphorate in the other, can be used following exposure to infectious syphilis up to and possibly through the development of primary lesions—about three to four weeks. Prophylactic treatment two months after exposure of a patient who is clinically and serologically normal is probably unnecessary.

The masking of early syphilis following the use of prophylactic treatment, as outlined above, is a myth. With use of smaller doses of penicillin alone, namely, 300,000 to 600,000 units at a single injection, or a correspondingly insufficient amount by mouth, one might logically expect syphilis to be suppressed occasionally—the determining factor probably being the length of time that has elapsed since exposure. Probably even with this low dose most syphilitic infections are aborted. As pointed out by Harry Eagle, even very small doses of penicillin, administered soon after inoculation (24 hours), are capable of aborting syphilitic infection in rabbits (as little as 1,000 units at a single injection). Apparently, during the past few years there has been a decided increase in the reinfection rate for both syphilis and gonorrhea, so that abortive treatment is made more important or even mandatory. There seems to be increasing need for prophylactic treatment if reinfections are to be prevented.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

INCUBATION PERIOD OF THE COMMON COLD

To the Editor:—The Journal *recently published an article which stated that the common cold is caused by infection by a specific virus. Does the virus produce common colds within a few seconds or minutes? Is it supposed to have no incubation period similar to the incubation period of bacterial infections? Many times I have prevented a common cold when in a moist chilled condition by putting my back to a hot radiator and getting thoroughly warm, the heat counteracting my chilled condition, relaxing contracted arteries. Lying down covered with heavy bed clothes is good but not so effective, because there is no external source of heat to help the depresse body heat. Hot drinks are helpful as are vasodilating ags, among which is the much vaunted whiskey. To what extent do medical men hold that the common cold is caused by infection by a virus?*

George E. Barnes, M.D., Herkimer, N. Y.

Answer.—Exposure to cold may produce a local irritation in the nose with burning and thin discharge, which usually lasts only a short time and presumably is not an infection at all. Exposure to cold with many persons seems, however, in some way to promote a true cold of the virus type, which runs the usual course of several days to a week. A possible explanation of this sequence of events is that, in a person who is a carrier of cold virus, exposure to cold may let down the bars and enable the virus to produce clinical infection. Under these circumstances it is common experience that the exposure to cold precedes the onset of the disease, the common cold, by hours or perhaps a day. This interval probably represents the incubation period of the true infection.

ANESTHESIA FOR DENTAL SURGERY

To the Editor:—*A patient who requires local anesthesia for comparatively heavy dental surgery is sensitive to practically all the "caine" derivatives. She has been sensitive only of late, having had innumerable procaine infiltrations previously. I should like to know what local anesthetics might be substituted for infiltration anesthesia.*

Joseph R. Simon, M.D., Pittsburgh.

Answer.—The correspondent does not supply any clinical data as to type of reaction, pulse and blood pressure. It is therefore difficult to say whether the reaction in the patient is a true reaction to local anesthetics or whether it may be caused by the vasopressor component of the local anesthetic. It is also possible that it may be of psychomotor origin. If the reaction is due to the vasopressor, then local anesthesia should be tried with the omission of epinephrine or any similar compound. If the local anesthetic itself is the cause, one would recommend the trial of a drug which is unlike procaine, or not an ester of paraaminobenzoic acid. Dibucaine hydrochloride, 1: 15,000, 2 per cent piperocaine hydrochloride or 1 per cent lidocaine hydrochloride should be tried. A short-acting barbiturate, such as pentobarbital sodium, secobarbital sodium or amobarbital sodium, should be given at least two hours before the local anesthetic is begun; the injection should be given slowly, and both amount and concentration of the agent should be kept to a minimum.

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CORTISONE, MILD DIABETES AND CARDIAC INFARCTION

TO THE EDITOR:—*Is it advisable to treat rheumatoid arthritis in a mildly diabetic (blood sugar 160 mg. per 100 cc.) person with cortisone 12 weeks after a myocardial infarction? Earlier the patient, aged 67, with slight coronary insufficiency, received five doses of 100 mg. of cortisone. The effect on the rheumatoid arthritis was excellent, despite the short duration, but the treatment had to be stopped on the fifth day because the diabetes, despite a threefold increase in insulin dosage, became worse (blood sugar 350 mg. per 100 cc.). A fortnight afterward, after exposure, the patient experienced myocardial infarction. The electrocardiogram is now nearly as before, but there exists slight myocardial insufficiency, completely relieved by digitalis.* *M.D., Egypt.*

ANSWER.—Experience in the treatment of diabetic patients of the type described is as yet limited. In general the use of cortisone or pituitary adrenocorticotropic hormone (ACTH) has usually been followed by an increase in excretion of sugar and a rise in blood sugar values with a correspondingly increased need for insulin. However, in most diabetic patients this apparent increase in the diabetes is temporary, and often it is not necessary to make great increases in the insulin even when glycosuria is moderate or severe. Indeed, the danger of causing hypoglycemia in a patient with coronary disease should be constantly in mind. It has been noted that increases in blood sugar during treatment with cortisone are less pronounced if potassium chloride is being given at the same time. However, the administration of potassium is dangerous if oliguria is present or impending. The use of cortisone for the relief of the arthritis may be recommended. The fact that the patient is now recovering from coronary infarction and that some myocardial insufficiency is still present would certainly indicate that caution be used in administration of cortisone. However, the advantages would seem to outweigh the risk.

CHOLESTEROL CRYSTALS IN PLEURAL FLUID

TO THE EDITOR:—*What is the significance of cholesterol crystals in pleural fluids in cases of frank pulmonary tuberculosis? Two patients with this diagnosis died suddenly, one of acute coronary infarction, the other of acute pericardial effusion, also containing cholesterol crystals. Will harm result from the intravenous administration of 25 per cent dextrose solution—400 ml. in about 10 to 15 minutes—for augmenting calories in several anorexic patients? What are the changes that occur after such a transfusion?*

R. N. Ichaporia, M.D., Panchgani, India.

ANSWER.—Cholesterol crystals in the pleural fluids usually signify hypercholesteremia or an abnormal cholesterol metabolism, about which little is known. A supersaturated solution results when the pleural fluid is partly resorbed, resulting in the crystalization of cholesterol. Another cause may be an obstruction of the thoracic duct causing chylothorax. Cholesterol may be crystallized out in the same manner as described above.

A 25 per cent dextrose solution should never be used intravenously except in small quantities. After a few hundred cubic centimeters a pronounced diuresis results that causes dehydration and ultimately hyperthermia. It is better to give 5 to 10 per cent solution or give only small quantities (50 cc.) every half-hour.

TENSION HEADACHES

TO THE EDITOR:—*Please send information on the intravenous use of amobarbital (amytal®) sodium in the diagnosis and treatment of tension headaches? What company makes this product? Melvin B. Lamberth Jr., M.D., Kilmarnock, Va.*

ANSWER.—Sodium amobarbital has been used intravenously for many years as a means of exploring the psyche of patients who in the waking state are hesitant about releasing tension-laden material or who have difficulty in remembering because of emotional blocking. This method was called narcoanalysis by the British and was used extensively during World War II.

It is logical, therefore, that the drug could be used for the establishment of emotional causes for functional headaches, so-called tension headaches. On release of the anxiety associated with the headache, sometimes a so-called abreaction is effected. In short, the anxiety producing the headache is released and, as the patient begins to understand the basis of his tension, which is expressed in the somatic symptom, he can often prevent the recurrence of the symptom.

Sodium amobarbital can be obtained through any authorized drug house. One ampul, 0.25 or 0.5 Gm., in 5 cc. of water is commonly used. The drug is administered slowly, 1 cc. per minute, until the patient begins to relax, at which point he usually begins talking, or until he feels a little drowsy. At this point the suggestion is given to him to describe the experiences which seemed to precipitate his problem. Sometimes, when there is a specific solitary instance (not usually in tension headaches), the patient can be brought back to a time before the onset of the symptom.Then he is carried forward chronologically to the tension-producing experience. As he relives this experience and recreates the situation that produced the symptom, he "abreacts," and, as he learns to understand how his symptoms occur, amelioration or cure may result.

NITRATE CONTENT OF DRINKING WATER

TO THE EDITOR:—*What percentage of nitrate content in drinking water is considered dangerous for use in infants?*

M.D., Illinois.

ANSWER.—The critical nitrate nitrogen concentration in drinking water that may cause methemoglobinemia when used in a feeding formula depends on the infant's susceptibility, the increase in nitrate nitrogen concentration resulting from boiling of the water, the quantity of water consumed daily, the duration of exposure to high nitrate water and possibly other factors.

Although 10 ppm nitrate nitrogen (10 ppm of nitrogen occurring in the form of nitrates) is usually considered the permissible level, the Committee on Water Supply, American Public Health Association, has commented that it is "impossible at this time to select any precise concentration of nitrates in potable waters fed infants which definitely will distinguish between waters which are safe and unsafe. . . ." Available data on 213 infant methemoglobinemia cases indicate that none was associated with waters containing up to 10 ppm nitrate nitrogen and only five cases were attributed to waters containing 11 to 20 ppm nitrate nitrogen.

The analytical results on a water are usually reported as the ppm nitrogen occurring in the form of nitrates; however, data in the literature have sometimes been expressed as ppm of nitrates (1 ppm $NO_3 = 0.26$ ppm N). Theoretically, nitrogen in the form of both nitrates and nitrites is of concern, but in most cases the nitrite nitrogen concentration is so small, when compared to that of the nitrate nitrogen, that its determination is usually omitted.

LEUKOPLAKIA OF VOCAL CORDS

TO THE EDITOR:—*Are there any reports of high vitamin A therapy or of diethylstilbestrol therapy benefiting leukoplakia of vocal cords? Is complete voice rest essential? What about smoking?* *M.D., Illinois.*

ANSWER.—The treatment of so-called leukoplakia of the larynx is dependent, in the long run, on whether the lesion is benign, whether it has a tendency to assume malignant aspects or whether there are definite carcinomatous changes already present. In general, while the disease is benign, there are enough instances in which carcinoma has developed on the basis of a previous leukoplakia to make repeated biopsies and prolonged observation the most important part of the management of these cases. There is reason to believe that tobacco should not be used. Patients with the benign forms should conscientiously practice vocal rest but not necessarily total silence; the other forms, dependent on the judgment of the surgeon, will require various forms of surgical intervention.

DEFICIENT PRODUCTION OF GROWTH HORMONE

To the Editor:—*An 11 year old boy, weight 48 pounds (29 Kg.), height 49 inches (124 cm.), has not progressed for the past two years in weight or height. The child is entirely normal, has a normal blood picture and normal urine. A roentgenogram shows the sella turcica to be extremely small, suggesting almost complete atrophy. The roentgenograms of the skull do not show ossification of the suture lines, and roentgenograms of the long bones do not show premature calcification of the epiphysial line, although two of the small bones in each wrist are missing. He has received various types of pituitary preparations and for the past eight months has received large doses of a pituitary growth factor (Parke, Davis and Company) daily in addition to 2 grains (0.13 Gm.) of thyroid. His chief problem arises at school, where he is too small to play with the large boys and too bossy when playing with the little boys. He resents being the smallest boy in his class. I will appreciate suggestions.*

M.D., Los Angeles.

Answer.—The patient probably has a deficient production of pituitary growth hormone. The following regimen is suggested: 1. If the basal metabolism is normal, no treatment should be given until the age of 12 years. 2. If the basal metabolism is low, it should be raised to normal and maintained at this level with desiccated thyroid. At the age of 12 the patient should receive, in addition, chorionic gonadotropin, 500 I.U. three times a week by intramuscular injection. This will induce some degree of skeletal growth, although it is not a substitute for the growth hormone of the pituitary, without which the skeleton cannot obtain normal length. Commercial extracts of the growth hormone are not satisfactory.

EXFOLIATIVE DERMATITIS

To the Editor:—*I am treating a 50 year old Negro for severe generalized exfoliative dermatitis. He had been a construction worker for 18 months, handling mortar daily, with resultant thickening, drying and fissuring of the palmar aspect of both hands. He continued to work and eventually gradual extension of dry eczematous dermatitis developed on the wrists and arms, and about two months ago extensive severe exfoliative dermatitis developed. Can you refer me to any literature on the occurrence of exfoliative dermatitis following use of mortar or cement?*

Francis W. Epstein, M.D., Toledo, Ohio.

Answer.—Exfoliative dermatitis rarely is thought to be an occupational disease. Chlorine has been mentioned as a cause, as have pyrethrum, flour, butcher's work and some petroleum fractions. Portland cement is not known to have been specified. However, most dermatologists agree that exfoliative dermatitis somewhat readily originates at the site of many forms of chronic dermatitis induced by local irritants. It cannot be denied that cement may induce the usual types of alkali injuries. The lesions are consonant with those associated with the subsequent occurrence of exfoliative dermatitis. However, it may be incorrect to maintain that the cement was the primary agent in this case, since many other common agents are equally culpable. The precise cause of dermatitis exfoliativa probably remains undetermined. In the chapter on cement in the International Labour Office's "Occupation and Health: Encyclopedia of Hygiene, Pathology and Social Welfare" (Geneva, Switzerland, International Labour Office, 1930-1934) this item is extensively covered, the main point being that cement dermatitis may assume a wide variety of forms.

METAL FUME FEVER

To the Editor:—*Is there any reliable method for preventing "brass chills" in brass foundry workers other than with ventilation?*

W. R. Agricola, M.D., Newcomerstown, Ohio.

Answer.—The key to the prevention of metal fume fever, of which "brass chills" is one type, is the avoidance of the offending metal oxide in the atmosphere as breathed. Ordinarily this means exhaust systems or some form of removal of excessively contaminated air. In lieu of such facility but at a lower level of satisfaction, the following suggestions may contribute some degree of betterment: Filter types of masks may be worn by the individual worker. However, workmen in hot areas are usually averse to the wearing of masks, which in truth are likely to be uncomfortable. Overheated metal favors metal fume fever. If temperatures are held near to the minimum required in the founding process, fewer instances of chills will arise than when the metal is "burned." Regularity of work attendance lowers the incidence of chills. The tolerance developed by foundrymen is easily lost. A few days of absence, even the nonworking week end, adds to the prospect of damage. In some, excessive alcohol intake is linked with chill appearance.

ALLERGY TO TOBACCO SMOKE

To the Editor:—*The reply to the query on "Allergy to Tobacco Smoke" in* The Journal, *Oct. 28, 1950, page 810, is well formulated, but I should like to add two things: 1. The clinical experiences of Dr. B. Z. Rappaport, clinical chief of the Allergy Unit, University of Illinois-Postgraduate Division, Chicago, were reported some years ago and were summarized in his article(s) on "aldehyde sensitivity" resulting from the incomplete oxidation as discussed under acrolein release in the answer. This work might profitably be read for additional good material apropos of this commonly encountered problem. 2. My personal feeling is that Hollister-Stier tobacco smoke extract, prepared as Dr. Pipes originally proposed, has been useful in allowing persons to tolerate amounts of tobacco smoke hitherto intolerable to them. I agree that skin testing is without much value, and we rely solely on history for diagnosis but find most useful gradually increasing intradermal (wheal) amounts from 1:1,000 up to concentrate as supplied.*

C. H. Kalb, M.D., Plankinton Bldg., Milwaukee.

SPERMATOZOA AND VAGINAL ACIDITY

To the Editor:—*In connection with your answer to a Rhode Island physician's question, "Is it rare for pregnancy to result from a deposition of sperm on the vulva without intromission?" (J. A. M. A.* **145:**59 *[Jan. 6] 1951) the following from "A Text-Book of Obstetrics" by Barton Cooke Herst (Philadelphia, W. B. Saunders Company, ed. 4, 1903) may be of interest.*

"The motility of the spermatozoa," says Herst, "accounts for the cases of conception without insemination after a mere deposition of seminal fluid upon the external genitals.

"I have attended in confinement," he continues, "two married women with unruptured hymens and on one occasion a young unmarried girl with a perfectly intact hymen who had been impregnated, during an embrace with her lover in the erect posture from the deposition of semen upon the labia majora."

Walter A. Landry, M.D., Chester, Pa.

VORACIOUS EATING

To the Editor:—*In the answer to the query on voracious eating in a 14 year old girl with amenorrhea (J. A. M. A.* **145:***126 [Jan. 13] 1951), anorexia nervosa should be considered. Nemiah states that the clinical concept of this syndrome should be broadened: the gastrointestinal component is not just loss of appetite, but rather an eating disturbance ranging from true anorexia to bulimia, and frequently associated with nausea and vomiting (Medicine* **29:***225 [Sept.] 1950). According to Weiss and English, in all cases of this condition studied psychologically there have been serious neurotic traits and sometimes even psychotic manifestations (Psychosomatic Medicine, ed. 2, Philadelphia, W. B. Saunders Company, 1949). There is great immaturity in personality development. Eating sometimes represented impregnation, and obesity symbolized pregnancy. Psychotherapy would be indicated for this girl if the diagnosis of anorexia nervosa is made.*

Eugene H. Kaplan,
Senior, New York University College of Medicine,
New York.

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